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TUBERCULOSIS

OR

PULMONARY CONSUMPTION

ITS

PROPHYLAXIS AND CURE

BY

SURALIMENTATION

OF

LIQUID FOOD.

BY

W. H. BURT, M. D.,

OF CHICAGO, ILL.,

AUTHOR OF CHARACTERISTIC MATERIA MEDICA, PHYSIOLOGICAL MATERIA MEDICA, THERAPEUTICS OF TUBERCULOSIS OR PULMONARY CONSUMPTION, POLYPORUS OFFICINALIS, POLYPORUS PINICOLA USTILAGO MAIDES, AND CHINCHONA OFFICINALIS.

CHICAGO:

W. T. KEENER,

96 WASHINGTON ST.

1890.

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TO

M. LE DR. J. P. JOUSSET,

OF PARIS, FRANCE,

IN GRATEFUL ACKNOWLEDGEMENT OF HIS HIGH ATTAINMENTS IN THE FIELD OF

CLINICAL MEDICINE,

AND IN TOKEN OF A WARM PERSONAL ESTEEM, THIS VOLUME IS MOST CORDIALLY DEDICATED.

THE AUTHOR.

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INTRODUCTION.

It is estimated that more than one-eighth of the entire mortality of the human family is due to the fatal ravages of tuberculosis. Any treatment, therefore, that will lessen this great mortality, will be accepted by man, as not only a blessing, but a great boon to those suffering with this fatal malady.

Eight months ago, while reading about the wonderful cure of obesity in Prince Bismarck, by taking away all liquids and the carbo-hydrates, and putting him upon a nitrogenous diet, this flashed through my mind: If the taking away of water and the carbo-hydrates from an obese person will arrest the obesity, will not the giving of an abundance of water, commingled with the carbo-hydrates, cure all wasting diseases, especially that of tuberculosis; at once I resolved to give this hint a clinical test, and the results have surpassed my most sanguine expectations, and I now have the great pleasure to announce that the *suralimentation* of liquid food is not only the *greatest* of all *known prophylactics*, but that it will *actually arrest* and *cure tuberculosis*, or pulmonary consumption. When used in the first and second stages of phthisis, it will enable the physician to cure more than fifty per cent. of the patients that would have to die, with the best methods known to medical science up to the present date. In the third, or last stage, it will give only temporary relief. All persons

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suffering from wasting diseases, and particularly that of tuberculosis, require considerable more food than people in health, on account of the greater bodily waste going on in the system. The digestive powers of the system in those suffering with phthisis have no relation to the appetite; when liquid food is introduced into the digestive canal, an immense quantity will be digested and assimilated perfectly, with the result of building up nutrition, and reproducing the appetite.

Suralimentation (excess of food) of liquid food, produces rapid gain in weight and strength of the body; surpassing anything known to science.

When fluid food is taken in excess the general atonic condition of the body, with its emaciation and debility, gives away to increased nutrition and tonicity. The cough, expectoration, hectic fever and night sweats cease under the influence of the *suralimentation* of water, with greater rapidity than by any other agent known to the physician.

Water is the most important of all liquid foods; over three quarters of the human body being water, it follows, therefore, that over three quarters of our food should be water.

Water is the greatest tonic that can enter the human body; when taken into the system, it assists in building up the organism and repairing its tissues when worn out.

Water constitutes a part of every tissue in the human body; both uncombined and also chemically combined, with the tissues in such a way that it cannot be driven off by evaporation.

Water maintains a proper bulk in both the blood and tissues, rendering them mobile and soft, instead of dry and hard.

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Water holds in solution the waste matter of the body and transports it out of the system.

Water takes up the waste heat of the body and caries it away, and three quarters of our bodies being water, it wastes with every breath and motion of the body; and this waste must be constantly restored by a fresh supply.

Water is the natural beverage of man; it slakes his thirst, and cools his blood in warm weather and during a fever. When taken hot, it carries heat into the circulation, after exposure to cold.

Water is essentially requisite in the process of digestion and absorption, and as a food solvent.

Water promotes an active circulation of the fluids, and accelerates albuminous metabolism.

Water increases the activity of the kidneys and the amount of urine secreted.

Water, in large quantities, increases the elimination of urea, and in this way acts as an accelerator of nutritive changes.

Water, passing from the fluid form to that of vapor, is the means of keeping down body temperature, which otherwise would rise to a point incompatible not only with the capacity for exertion, but with life itself.

Water being exhaled in great quantities from the skin, renders drink imperative, whether it be in the tropics, or the heat of iron works, or in stoke holes.

Water, to the amount of six pints, is required daily, to meet the water loss by the kidneys, skin and lungs, to sustain the normal adult body in health; and twice that amount in wasting diseases.

Water is required for the secretion of the saliva, the gastric juice, the bile, the pancreatic flow, and the intestinal secretions.

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Water drunk copiously at our meals does not dilute the gastric juice, but greatly assists digestion.

Water enters into the composition, in greater or less proportion, of all solid and liquid foods, and is the essential basis of all our beverages.

Suralimentation of liquid food should always have combined, and used in conjunction with it, the best remedies known to medical science, and with this in view, I have added all of the most practical remedies in our literature, together with all of the auxiliaries at our command, so as to make this volume practical and complete. The pathology has been omitted, as every physician has it well written up in his library.

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ÆTIOLOGY.

A FEW words as to the cause of tuberculosis. To me its neural origin is as plain as any fact in pathology: its real cause being a *debility, pareses or neurasthenia* of the organic nervous system; the cerebro-spinal being in strong sympathy with the organic. This neural debility produces *mal-nutrition* with tubercular infiltration and all its symptoms.

It is a well-known law in nature, that like produces like. Now, when one, or especially both parents are afflicted with tuberculosis, their offspring have, at the moment of conception, this tubercular diathesis stamped upon their bodies, and ninety children in every hundred, born of such parents, will die of tubercular consumption.

The physical make-up of a tubercular patient, which is stamped upon him in utero, and during the whole period of his organic life, is shown by the large cerebrum, small cerebellum, slender neck and chin, contracted, long, flat thorax, with its small antero-posterio diameter, creating the impression as if the arched chest-wall had sunken in, or the vertical diameter had been enlarged at the expense of the sterno-vertebral diameter. With this there is thinness of the adipose layer and muscular tissue and slight inspiratory elevation of the chest. The term "paralytic thorax" describes this appearance very appro-

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priately. The separation of the clavicles from the chest-wall is caused in part by the emaciation of the soft parts, but only attains higher grades by the sinking in of the thorax over the retracted apices of the lungs. The separation of the scapulæ also results from the thinness of the adipose tissue, and the emaciation and atony of the muscles (trapezius, rhomboids, latissimis dorsi, serratus) and is found most distinctly when the neck is "hollow," i. e., when there is marked convexity of the upper dorsal vertebræ, with compensatory lordosis of the lower dorsal and lumber spine, as is found so often in a long thorax. The flatness of the thorax and its small antero-posterio diameter are best recognized when the chest is looked at from the side, the arms being raised. Still more convincing are the figures obtained by means of Woilldez's cyrtometer. On the following page I show you a few of these sections made through the spinous process of the ninth dorsal vertebra and the base of the xiphoid appendage, and in patients between the ages of twenty-five and forty years, as a matter of course, they are greatly reduced in size. Taken from Dr. H. Von Ziemssen's Ætiology, Diagnosis and Treatment of Tuberculosis.

It takes but a small exciting cause to develop in such a party, a well-marked case of consumption; as for example, puberty with its manifold excitements and depressions; excesses of all kinds, especially sexual; dampness; want of exercise; occupation; bad ventilation; physical exposure in cold damp atmosphere, climate, etc.; anything which tends to enervate such people. Their effects will soon be shown in the peripheral nerve endings of the great sympathetic nerve in the lungs, or any other organ the disease centers upon.

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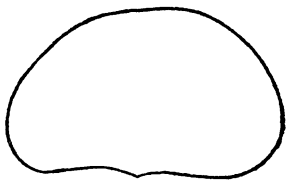

FIG. 1.—Phthisical Woman, aged 28 years. Narrowing of the left side.

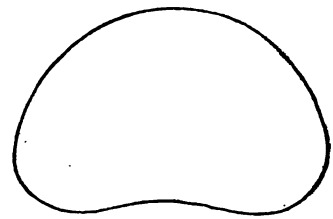

FIG. 2.—Phthisical Man, aged 25 years. Soft parts extremely emaciated.

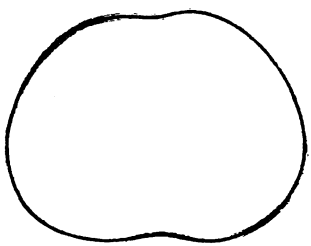

FIG. 3.—Normal Thorax, firm muscles, man aged 32 years.

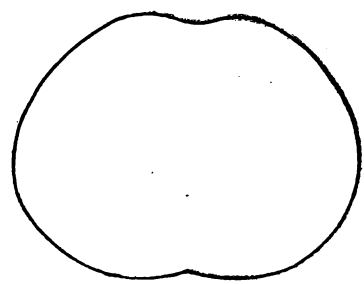

FIG. 4.—Ectatic Thorax in an Emphysematous man of 40 years.

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This innervation, neurasthenia, paresis, or neurosis, is shown to us in capital letters in the

1. General Atonic Condition of the Body.
2. Emaciation and Debility.
3. Dyspnœa.
4. Hæmoptisis.
5. Cough and Expectoration.
6. Hectic Fever.
7. Asthma.
8. Thoracic Pains.
9. Diarrhœa.
10. Night Sweats.
11. Aphthæ.
12. Œdema.
13. Bed Sores.

That the animal nervous system is involved, as well as the organic, is shown to us by many pathological facts. For example:—when the lungs are involved, the functions of the vagi are greatly interfered with, producing dyspnœa and asthma. Brown Sequard found that if the base of the brain of an animal was injured, it would produce hæmorrhage in the lungs, showing the direct action of the pneumogastric nerve upon the capillary vessels of the lungs.

This *paresis*, or *innervation* of the lung capillary vessels in almost all cases, commences in the apices of the lungs, in the lobules that are used the least, and the first organic lesion in pulmonary tuberculosis is always found in the apices of the lungs; the capillary vessels of these fine lobules become congested, tubercular infiltration soon take place, with softening, hæmorrhage, followed by ulceration, with all the other symptoms of phthisis. The first pulmonary hæmorrhage of tuberculous individuals does not

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come from healthy tissue, but from diseased lobules of the lung.

In every case of consumption, and other wasting diseases, there is present from the first inception of the malady, a *marked inability* to *appropriate* a normal quantity of *Oxygen* by respiration. This may be owing to structural defects; confinement indoors, in a vitiated atmosphere, nervous debility, or catarrhal diseases of the air-passages. Let the cause be what it may, so soon as a normal quantity of Oxygen fails to reach the blood and tissues, the digestive and assimilative powers fail, followed by a feeble circulation of the blood and mal-nutrition. The earliest defect in digestion is in the direction of fatty matters, for the reason that there is not present a sufficient quantity of Oxygen to utilize these foods. Every one hundred parts of fat, requires two hundred and ninety-five parts of Oxygen for its perfect transformation into tissue; and failure to get Oxygen, means want of power to digest fatty foods, consequently there is a steady waste of tissues, with all that this implies. This is true not only of carbonaceous foods, but of all foods, as the quantity of Oxygen present determines the capacity to digest any and every kind of food. Now Carbon in the human system, as elsewhere in nature, is converted into *potential energy* only when it meets with Oxygen. Carbon and Oxygen are the great *force producing* elements of life; when these are abundantly furnished to the victim of wasting disease, assimilation is stimulated and all kinds of food can soon be utilized. (If pure distilled rain water is charged with Carbonic acid and drunk to *suralimentation*, the system has just what it is praying for, assimilation will be stimulated, and the tissues will resume their normal life again. Water is com-

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posed of Oxygen aud Hydrogen; the air, of Oxygen and Nitrogen, and with the addition of Carbonic Acid, we have about all the elements of the human body; and this is the scientific explanation why water with the carbo-hydrates is so successful in the treatment of tuberculosis.) But as soon as the functions of the lungs are impaired and we have feeble respiration, we also have a feeble circulation, and the blood does not give off its Carbonic acid, which poisons and retards nutrition, producing loss of appetite, and all the factors that go to produce tuberculosis.

Tubercular Bacillus.—Dr. Koch's theory of the bacillus as being the cause of *tubercular consumption*, has been accepted by a great majority of our profession. This beautiful, but impractical theory, I have tried hard to accept, but after having read about all that has been written upon it in the English language, I am sorry to say, I cannot accept it. To me, no more silly, and unscientific craze has ever found a foot-hold in scientific pathological medicine, than this Bacillus Theory, and I predict, that in ten years from to-day, the great majority of physicians that accept it now, will have discarded it as a delusion. If Dr. Koch is right, these five corollaries naturally grow out of it, viz.: contagion, ætiology, diagnosis prognosis and treatment are settled. But is this a fact? *No, most emphatically no.* Is it contagious? *No*, and not over one-half of the physicians that accept the bacilli theory, believe that it is. But it would be if they were right. The intimate contact of a wife with a husband dying with phthisis, or *vice versa*, or the intimate contact of the nursling with a phthisical mother or nurse; the kisses of a tuberculous mother; or the inhalation of the breath and

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dried sputa from phthisical patients; or the infection of the child's food with the bacilli. All these, if it was contagious, would soon give us positive evidence. But have they done so? No. The best writers on this subject are none of them quite satisfied. In the Reference Hand Book of Medical Science we read: "But after all, the immense amount of clinical observation on this point at the command of every experienced practitioner, must convince us that the danger is far less than would first appear." And Dr. H. Von Ziemssen says: "We must, therefore, still cling to heredity as the explanation of the enormous frequency of tuberculosis in the children of tuberculous parents. Every day the physician sees tuberculosis reap its rich harvest among the progeny of a tuberculous father or mother. The children of such parents grow up scrofulous in childhood, and perish tuberculous in youth. We must wait for the explanation of its contagion, for the further development of our science." There is much evidence to show that tuberculosis is exceedingly rare among the Jewish nation. Why? Simply because they spring from a good, non-tuberculous stock, contagion and heredity cannot effect them.

Transmission of Phthisis in Married Life.—M. Leudet has occupied himself with collecting some statistics on the question of whether a wife can give phthisis to her husband, or a husband to his wife. He has taken 112 widows and widowers, whose husbands or wives respectively have died in undoubted phthisis. Out of these seven were phthisical; but several of them had facts in their previous history, before marriage, showing a phthisical tendency. His reference was, therefore, that the transmission of phthisis in married life must be very rare; even more

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rare in the upper classes than in the middle and lower. In 80 out of these 112 cases there was a family history which he could follow; and 27 of these showed some members who were phthisical.—*The Practitioner.*

The doctrine of the contagiousness of phthisis is working a great evil in the outside world. A case in point: A nervous timid lady living in Chicago, has been in the habit of going every fall to Florida, and spending the winter. Last summer she happened to read in a paper that phthisis was very contagious. In the fall she went as usual to Florida, and she met in every hotel and boarding-house, numbers of phthisical patients, and the most that greeted her ears, was, the constant coughing of these patients; this so worked on her mind that she imagined there were in every room, on every wall and in every bed, millions of these wicked and poisonous bacilli laying in wait for her, ready any moment to inoculcate her with consumption. She became so terribly frightened that in two weeks, packed her trunk and returned to Chicago. Now there are thousands of timid, but healthy people just like this lady, where this nonsensical doctrine is working a great physical injury. Already the State Board of Health of California has been greatly exercised over this supposed danger. It even suggested in a recent bulletin, the advisability of establishing a strict quarantine against consumptives until measures of isolation and disinfection could be undertaken. The daily press has taken up this question, and the result is a monster scare all over the State.

I am perfectly satisfied that phthisis is not contagious, but I can imagine, that, by simple contact in nursing phthisical patients if the pus and mucus of

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the phthisical person were taken in large enough quantities, into the system, it might be infectious; the same as a fly might produce syphilis. If a fly should light on a syphilitic ulcer, crawl about and feed on it, then immediately light on the moist mucus membrane of a man's genitalia, the result would be that he would have syphilis. Was the fly the cause of the syphilis? Most certainly not; it was simply the carrier of the poison. The same might be the case with the tuberculous bacilli. A man can never inhale enough of these bacilli by simply associating with a phthisical patient, to produce phthisis, but they might cause it when injected directly into the tissues.

The early diagnosis of pythisis is of the most vital importance to the patient, but the detection of tuberculous bacilli at this stage of the disease is utterly impossible; even in a later stage when extensive tubercular deposits exist, often they cannot be found. A case like this has just come under my personal observation. A patient suffering with phthisis went to the erudiate professor of practice in Rush Medical College, he examined the sputa carefully with the microscope, could find no bacilli, pronounced the case not phthisis, but chronic bronchitis, advised the patient to go to Denver, and he soon would be well. He went to Denver, and came back a corpse in seven weeks, having succumbed to genuine phthisis. Now this is a well educated physician, second to none in the city, and if he cannot detect these bacilli in the advanced stages of phthisis, of what practical use is this theory?

As to the value of the theory in prognosis, it has none. Patients can be found by the score, going rapidly down, losing flesh and strength from day to day,

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whose expectoration after repeated microscopical examinations is found to contain but few, and often no bacilli, because of the cheesy matter not having entered the bronchi. While on the other hand, large numbers of the bacilli might be found in the sputa of of those whose disease was advancing but slowly, or not at all.

In regard to treatment based on the discovery of the bacilli tuberculosis, *aside from cleanliness*, it is pronounced by the best and most able living physicians, as absolutely valueless, and in many cases harmful. Antiseptics are only of value in the way of cleanliness and removing morbid secretions. The germicidal treatment with Iodoform, Corrosive Sublimate, Creosote, Acetate of Lead, Tannin and Benzoate of Soda, have been signal failures.

The strongest argument that can be used against the bacillus theory, is this: Cod Liver Oil has cured thousands of cases of phthisis. The attenuated homœopathic remedy has cured many thousands of cases, and the *suralimentation* of liquids have cured many cases. Can any of these kill the bacilli tuberculosis? The answer is no; on the contrary, they are decidedly favorable to the growth and propogation of the bacillus. But how do they cure? Why, by so acting upon the nerve filaments of organic life that *nutrition is stimulated*, and the tissues resume their normal functions again.

Bacteria.—These Micro-organisms,schezomycetes, bacilli, or bacteria, are found everywhere; in the air, on the surface of the ground, in our food, and in the water. Of what use are these micro-organisms? Why, of great use; some cause the fermentation of the yeast plant; some that of Alcohol; some that of Acetic acid, and some that of putrefaction of dead

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animals and vegetables. What are their uses in man? Why, they are man's *true scavengers*, and are found wherever there is disease, with inflammation, ulceration, or decomposition in any of its forms. Their food is decomposition, and if it were not for these micro-organisms absorbing the poisonous ptomains and gases produced by disease, man would be destroyed from off the face of the earth. Instead of bacteria being a cause of disease, *they are only the effects*, and are one of God's greatest blessings to man. Pasteur rightly concluded, that bacteria are necessary for the life of animals and plants; for without their agency in the putrefactive disintegration of dead bodies, the higher plants incapable of feeding upon the complex molecules of dead animals and plants, would die.

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PROPHYLAXIS.

Prophylaxis.—Here is where the physician can prove himself of absolute use to his patient. It is in the prophylaxis of this fatal disease, that the greatest triumph of the *fluid diet* is shown. When a person having a predisposition to consumption, with a delicate constitution, shows signs of defective nutrition, with steady diminution in the weight of the body, it has a decidedly unfavorable significance, and so much the more, the more rapidly it progresses. On the contrary, a steady, though slowly increasing weight, informs the patient that his condition is growing more satisfactory, and he is physically walking away from consumption. Just here, nothing known to science up to the present moment, can equal the nutrient fluids, to invigorate the debilitated constitution and nourish the wasting tissues. *Nutrition* is the *grand factor* in the prevention of tuberculosis. If we fail in *nutrition*, our patient is lost. But if we succeed in *nutrition*, to build up and fatten the tissues, we can bid defiance to that great destroyer, tuberculosis. It is always understood that with these fluids he should eat in addition *a well selected solid diet*. What favors the development of tuberculosis? Why, very little recreation, no exercise in the open air, monotonous diet, loss of sleep, confinement to the atmosphere of one ill-ventilated room, especially a badly ventilated sleeping-room; mental disturbances, spiritual strug-

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gles and particularly worry, associated with deep remorse. This will soon produce anæmia muscular weakness, dyspnœa, and tubercular infiltration of the lungs. Our prisons give us fine examples of these truths. Tuberculosis has a mortality three to four times greater in prisons than among the free population.

The most important prophgylactic measures to take: Instead of remaining in doors, out-door exercise; instead of exhausting constant work in doors, regular, not too exhaustive out-door exercise with intervals of rest; instead of meagre fare, a generous mixed diet combined with a large quantity of the fluid, the fluid being taken, at least, every half-hour between meals. Joined with this, the patient should sleep at least nine hours in the twenty-four. If the patient be wealthy, recreation should be sought in mountain or sea air. The climbing of the mountain will not only cause him to take deep respiration of the purest air that can be found, but will increase his lung capacity, something greatly to be desired in the feeble-chested consumptive. Nothing should be left undone, that will increase and deepen the breathing capacity of a phthisical patient. Very important is an erect carriage of the body, with gymnastic exercise, so as to develop the muscles of the chest; also, *pure, fresh, unlimited amount of air, at all hours, at all times, and in all places.* Pure air is not to be found in crowded habitations, in work-shops, in school-rooms, in church-rooms, in theatres, or in a crowd anywhere.

It has been determined statistically, with regard to the soldiers of the French and English armies, that the number of phthisical affections rapidly diminishes with the beginning of war operations and manœuvres,

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and rises at once with the return to peaceful life in the barracks. The German army undoubtedly owes its slight tuberculosis morbidity not alone to the careful selection of recruits, and to the good hygenic condition of the barracks, but chiefly to the *marches* and other *open-air exercises* which are carried out regularly during the summer and winter.

"This is also true of all seminaries, orphan asylums, and schools of a conventional character. The greater the interference with the free movements of the youthful individual, the more frequent is tuberculosis in such institutions. Fourcault's examples furnish the most striking proof of this. In fact, state supervision of the hygiene of seminaries and similar institutions, especially girls' boarding-schools, is urgently required. The degree of freedom and of active out-door exercise among the youth is much too small. Even in the public schools, especially the middle schools, the youth suffer from pedantic restriction of the enjoyment of fresh air in the intervals between lessons, owing to the over-anxious care for order and discipline. At home also, the child must return to his lessons immediately after lunch. There are, no doubt, many bright pupils who easily master their home lessons in an hour, and then have time for walks, play, or instruction in music, but the average pupil, if industrious, works the greater part of the afternoon and evening at his lessons, and goes into the open air very little, or not at all. How many constitutions are destroyed yearly by this preposterous mode of life. Look at the pale, lean, boys and girls as they leave school tired and worn at the end of the school day, and compare them with English boys and girls, who are permitted to enjoy every free moment, in school as well as out, in playing ball,

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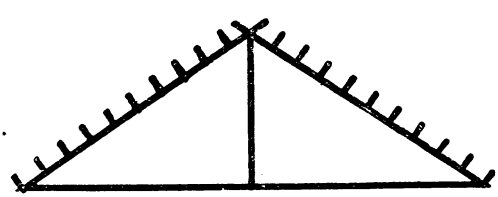
climbing, wrestling, rowing, etc. What a difference in the complexion, the brightness of the eyes, the activity of the bodily movements?

Methodical exercises in mountain-climbing, form an extremely efficient curative agent in chronic pulmonary disease, and are so much the more efficient, the higher the plateau from which the patient starts, the more rarified the air, and the slighter the atmospheric pressure; and the more free from dust, fog, rain and wind, the better.

This methodical exercise accelerates the respiration, deepens the breathing, expands the lungs, strengthens and develops the thoracic muscles, increases the circulation in the lungs, thereby producing perfect nutrition. If no mountain is close by, the patient should erect an inclined plane out in the open air, twenty or more feet high, and make a regular business of walking slowly up and down this inclined plane, from three to six times a day. Each exercise should last until he becomes quite tired. This will greatly increase the lung capacity, thereby producing perfect nutrition. This inclined plane can easily be made out of common lumber in this shape, with small cleats nailed across the plank, so as to make the walking good. When the weather will not permit of this out-of-door exercise, open the doors and windows to get good air, and then climb your stairs in the house, in the same methodical way, and thus nutrition will be increased, and the lung



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capacity developed, although not so well as it would be out in the open atmosphere. Select for this inclined plane a spot where there will be much sunshine. The amount of effort required, and the result should be carefully noted, so that the patient's strength will not be overtaxed.

It is time that medical influence should be extended to securing sufficient physical recreation to properly develop muscular vigor. These games and exercise should be taken in the open air, and so selected that all the muscles of the body will be invigorated and developed, especially those of the thorax, so that the vital capacity of the lungs will be constantly increased. This can be done by various gymnastic exercises, singing, playing wind instruments, base-ball, turning, skating, running, swinging the Indian clubs, tennis, hunting, horse-back riding, rowing, bicycling and especially mountain climbing.

The erect posture and the practice of deep breathing are of vital importance to those who are the least suspicious of an hereditary taint towards tuberculosis. (To those in moderate circumstances that cannot afford a trip to the mountains, or the sea-shore, an excellent substitute is a stay in the country, more or less remote from the large cities, and every moment of favorable weather must be spent in the open air).

Physical Culture Clubs should be formed by all phthisical people to play lawn-tennis. Playing lawn-tennis is the best open air physical exercise a woman can take. The best *stimulant for nutrition* is appropriate exercise, which by accelerating the circulation and respiration, and thereby causing natural wasting of the tissues, excites the demand for substance to repair it. The object of respiration is constantly to introduce into the blood from the atmospheric

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air, a certain amount of Oxygen, and constantly to give off from the blood to the air a corresponding amount of Carbonic acid gas. Perfect nutrition, then, is the perfect union of Oxygen with carbonic acid gas in the lungs. This calls for perfect ventilation in the sick room. While the giving off of carbonic acid gas by the lungs makes no impression upon the mass of the atmosphere at large, it soon sensibly deteriorates the amount of air inclosed in a moderate sized room, the breathing of which is most destructive to the phthisical invalid. Instead of inhaling only Oxygen and nitrogen, and expiring Carbonic acid gas and Nitrogen, he takes in a sensible amount of Carbonic acid at each inspiration, which prevents perfect combustion in the lungs by poisoning the arterial blood, rendering it unfit for nutrition; the lungs become irritated and burdened with loss of appetite, a watery condition of the blood, and every condition of the system takes place to hasten the disease to a fatal end. A proper ventilation of the rooms occupied by the patient is, therefore, absolutely necessary, and this especially applies to the sleeping-room. Mankind spend one-third of their life in sleep, while the invalid remains in bed much longer. How important, then, is it to secure a pure breathing air during this period.

PARIS, March 7th, 1890.

Dr. Dujardin-Beaumetz read a report on a work by Dr. Nicaise, at the last meeting of the Academy of Medicine, in support of his candidateship as a member of that learned body, the subject of the work being the treatment of phthisis by the permanent aeration of the dwellings occupied by phthisical patients, particularly the rooms in which they sleep: this to be effected by keeping the windows constantly

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ajar, even in winter, measures being at the same time taken to prevent the patients being cold. Dr. Dettweiler has proved that phthisical patients can live in the open air. In the establishment at Falkenstein, of an altitude of one thousand three hundred and twelve feet, in the midst of woods, the phthisical patients pass their time in the open air in all seasons. The results obtained are very favorable. It is reckoned that there are twenty-five per cent. of absolute cures, and twenty-seven per cent. of relative cures. Aeration is therefore very useful for tuberculous subjects. The researches of Dr. Nicaise have shown that at Carabaul a room with a southern aspect and a temperature which at sunset was 14° C., the window having been left wide open all day, could be maintained at about 10° C. during the night, even when the temperature fell to 2° C., if the shutters were closed and if the windows were left ajar about thirty or forty centimetres. In these conditions the aeration of the room, which was provided with a chimney, was perfect, and the temperature very acceptable, provided that the patient is warmly covered in his bed. These points are very important. It is true that the air respired by tuberculous subjects does not contain bacilli, but with them, as with healthy subjects, the expired air contains irrespirable gases; and the researches of MM. Brown-Sequard and d'Arsonval have shown the existence of volatile products and of toxines. These substances are dangerous to breathe; they end by accumulating in the rooms where the aeration is imperfect; it is therefore very important to get rid of them. Dr. Dujardin-Beaumetz thinks that it will be good practice to accustom phthisical patients gradually to live in an atmosphere properly renewed, which may be affected by certain arrange-

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ments which should not inconvenience the inmates. He adds that the non-success of specific medications in tuberculosis should engage us to ameliorate the hygiene of tuberculous subjects. To procure them proper aeration would be a real progress, but this must not be considered sufficient, and he concludes his report by insisting on the necessity of associating to the hygienic means a rational pharmaceutical treatment.

In cases of great weakness, emaciation and loss of appetite, when tuberculosis is not active, massage of the muscles of the body can be practiced with great benefit, and frequently with decided gain in weight and appetite, with improved digestion.

The choice of the life occupation, to those who have a tubercular predisposition, is of vital importance. Those occupations are to be selected which will bring the patient in constant contact with the fresh out-door air, and maintain the muscular and respiratory systems in vigorous action. I would first of all, select the occupation of a *butcher* for a phthisical patient, and have him do his own slaughtering. The act of taking life cultivates vitativeness, and every animal he kills adds new life to his, as nothing else will, known to man. Others favorable, are farming, forestry, gardening, marine service, military service, theology and medicine. In the latter, the whole world is open to him and it is the best profession he can follow.

Avoid those occupations which entail constant stay in the impure air of closed rooms, and insufficient muscular activity; and a sudden change from life in the open air to that of indoors, is particularly to be avoided.

The prophylaxis against phthisis should date from

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birth. An infant should not nurse a mother who is consumptive, or whose milk is of poor quality. If a healthy wet-nurse cannot be secured, the bottle and cow's or goat's milk will be better for the child. Phthisical patients should not live on a low humid soil, or work underground in mines from which light, as well as pure air, is excluded. A deficiency of good wholesome food is another exciting cause of phthisis. They should not breathe air laden with foul vapors, or fine particles of dust. Avoid hot crowded apartments, and sudden changes in temperature. All sitting and sleeping rooms should be provided with fireplaces, and never left long without a fire.

Flannels should be worn next the skin the year round, selecting white or bluish-white. The white flannel permits a free escape of Carbonic acid gas, while red and other dark colors interfere with its escape. The supposed liability to, and danger of, catching cold often leads phthisical patients to wear an over-plus of clothing. When they strip for examination of the chest, not unfrequently they remove two or three undershirts, a woolen or fur chest-protector, an oil-silk jacket, or chamois-skin vest. The body is kept in constant perspiration by these articles. They occasion, not only discomfort, but debility. *Comfort* should be the governing principle in clothing. Articles of dress should be adapted to the seasons and to changes of temperature so as to secure comfort. This should be the guide to the patient, so as to avoid an over-plus of clothing. The underclothing should be of white flannel, or lambs wool, encasing the whole body and lower extremities, with woolen socks or stockings, the feet of which should always be white. During the summer months the under flannel should be made of lighter material. During out-door exer-

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cise, as carriage riding, the patient must prevent the chilling effect of radiation from his body, by wrapping up warmly in rugs and furs, with heat to the feet. It is very important to keep the arms warm days, and especially nights. Cold arms act as refrigerators to the blood immediately before it is discharged into the heart and lungs.

Hydro-Therapeutics.—This is an important agent in the prophylaxis of phthisis, as well as in its more advanced stages. Water, in its various forms, is the best, simplest, and most acceptable means for strengthening and hardening a feeble body, which is predisposed to catarrhs and colds. Even the simple rubbing of the entire surface, immediately after rising from bed, with a wet *cold cloth*, accustoms the skin to sudden cooling, exercises the neuro-muscular system of the peripheral arteries to prompt reaction, and acts as a thermic irritant centripitally on the central nervous system; and from thence acts eccentrically, stimulating the innervation and functions of respiration, circulation and digestion. The temperature of the water should range from 90° F. to 40° F., commencing with the high for one-half a minute, and ending with the low temperature occupying one minute. The rubbing should be brief and the cloth should be well rung out; our object being to exercise a thermic and mechanical irritation on the cutaneous nerves, and vessels, and not to withdraw considerable heat from the body. This would happen if much cold water were left in the cloth, and it should be entirely warmed at the expense of the bodily heat. In feeble individuals, whose appetite and assimilation are below par, add to the water, after the third week, one-half to one pound of common salt, and one-quarter of litre of mother-lye to one quart of water, making

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an artificial brine. This exercises a more vigorous and prolonged stimulus on the nervous system, than the simple thermal irritant, and, like the action of the brine bath, increases the nutritive changes and the desire for food.

These rubbings may be carried out even in the poorest families, entail no expense, and are adapted to every occupation of the patient, in as much as they are performed in the morning immediately after rising, after which the patient may dress, eat breakfast, and then attend to his work. He is advised to exercise in the open air, if the weather permits, and he should not take breakfast until half an hour later. Very delicate individuals, particularly women, may be permitted to take a cup of warm coffee, or tea, before the rubbing.

Patients who have no attendant to perform the mechanical work of rubbing, must rub themselves, as well as they can, with large towels or obtain an apparatus for a shower douche. The shower bath does not entirely replace the rubbing, because the intense mechanical irritation and the uniform application to the entire surface, are wanting, but it is nevertheless a valuable means of hardening and strengthening the body.

The effect of this simple procedure, which may be varied in different ways, is one of the best that can be attained by the physician. It removes the sensitiveness to changes of temperature, wind, and moisture, and the tendency to colds, removes the constant gentle perspiration, the everlasting nasal and bronchial catarrh, the rheumatic disposition, etc. It gives to the body freshness and elasticity, which can only be secured in a similar way by brine or sea baths. In sea bathing, the chemical and thermal

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action of the cold salt water and the mechanical irritation of the movement of the waves, come into play, together with the rapid movement of the air, which is almost free from dust and bacteria while rich in water and chlorid of sodium. All these factors stimulate and invigorate the nervous system, and through it all the functions of the organism, particularly the appetite, nutrition; and of the respiratory apparatus, which is forced to take deep respirations and whose epithelium is strengthened by the rapid motion and the quality of the air.

A full warm bath should be taken by the patient two or three times a week.

Climate.—The selection of a suitable climate for a phthisical patient is a matter of considerable importance. What is really required is a cool temperate climate in an elevated country free from great alterations of temperature, which should range from 55° to 65° F. during the day, and from 45° to 55° at night. There should be a clear bright sun, as much as possible, with but little moisture in the air. In such a climate exercise can be taken daily, in the open invigorating atmosphere, which will greatly aid nutrition. In this country this climate can be best found in the elevated mountain slopes of Colorado, New Mexico, Texas, California and Georgia. To a less extent in Virginia, Kentucky, Adirondacks, Michigan, Florida, South Carolina, Louisiana and Minnesota. The foreign resorts are in Egypt, Algiers, Nice, Mentone, Nassau, Lima, Rio Janeiro, Cuba and the West India Islands.

The essential requisite to a favorable climate is a high altitude, of from 4000 to 8000 feet above the ocean level, where we have the elements of dryness, equability, and a pure rarefied atmosphere. A

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patient who in health has found cold weather more favorable to vigor and well-being, than warm weather, will be likely to find a cold climate more beneficial than a warm climate, and *vice versa*; and a cold climate is better suited to men than to women. In many patients it will be found that the agencies by which a favorable influence is exerted relate to accessory or incidental circumstances more than to purely climatic conditions. Climate has no specific influence in arresting phthisis, but through the exhilarating influence of a pure dry rarefied atmosphere, respiration is increased, and this increases the systemic circulation, which greatly stimulates and increases nutrition; and in this way, the phthisical patient is benefited. But to get this benefit, daily appropriate exercise out of door must be insisted upon. A protected place should be selected, and the party should live in a tent as much as possible. When a change of climate proves beneficial, the party should not leave it for at least five years. Experience has taught us, that to those patients benefited by a change of climate, if they return as soon as benefited, the disease will return with such fury that nothing will stay its progress but death.

Patients should never be sent from home when the disease is in active progress, with high temperature great emaciation muscular feebleness, cough and night sweats, etc. For when they leave home, they leave all the comfort that a home implies, to suffer many deprivations of luxuries, that loving kindred would be rejoiced to do, and to die among strangers.

General Conclusions.—The testimony of the physicians in Denver and at Colorado Springs was this: That the high altitude is specially recommended for (1) early phthisis, or where there is a tendency to

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this from hereditary predisposition; (2) hæmorrhagic phthisis; (3) chronic pleurisy, where after removal of the fluid the lung does not expand, and in chronic pneumonia where the consolidation is not removed; and (4) the second stage of the disease when it appears to be quiescent and there is no evidence of rapid disintegration. The patients who should not be sent, are those who suffer from heart disease, chronic bronchitis, emphysema, or where with phthisis in the first two stages, there is any nervous irritation and sleeplessness, or affection of the kidneys. They were also pronounced on a crucial question—viz, that there was not complete recovery, except in the incipient stage; that there was only a drying up of the tubercular deposit, which would again become active if the patient return, for however brief a time, to a climate which was variable and moist. The continuance of the dry aseptic air was essential, and disregard of this fact, led to a rapidly fatal issue. The patient, male or female, in whose case the phthisis is arrested, must necessarily live permanently in Colorado, or a high altitude. Fortunately this State is young, and there is room for all, and with renewed vitality and vigor the no longer invalid can find something to do, either in the open air or in some in-door employment.

Whatever change the patient should make, and wherever he should live, he must ever persevere to keep his *system filled with fluids* by taking fluid in some of its manifold forms every hour of the day. Drinking nourishing fluids should ever be before him as his life work, and go where he will, do what he may, drinking fluids must be first at all times, and in all places.

Oxygen Gas.—The inhalation of Oxygen is a pro-

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phylactic of great value in people predisposed to phthisis. One of the first and most marked effects of Oxygen gas is stimulation of the digestive and assimilating organs. When it is inhaled three gallons at a time should be taken three times a day. The appetite is greatly increased and the whole system invigorated to a marked degree, especially when this treatment is accompanied with active open-air exercise.

Dr. S. S. Wallen says: "Oxygen will be found of service in the following classes of cases: First, those in which, from some obstruction in the air-passages, an insufficient supply of Oxygen is allowed to enter the lungs, as in croup, constriction of the larynx or trachea, asthma, accumulation of mucus in the trachea, or bronchi during coma, or severe bronchitis. Second, where the lung is consolidated from either pneumonia or tubercular deposit, or in a state of atelectasis, or compressed by pleuritic accumulation, so that only a portion of the lung is pervious to air. Oxygen is competent to render great assistance to consumptives, at the beginning of that period which we will call the dyspeptic stage, when the patient coughs but little, grows thin, has no relish for anything, and is suffering from difficult or imperfect digestion. Especially useful in asthmatic lymphatic subjects with bronchial dilatation."

Oxygenated Water.—A combination of Oxygen and Nitrous oxide gases. Three parts Oxygen to one of the Nitrous oxide gases. Three parts Oxygen to one of the Nitrous oxide, forms a valuable prophylactic in phthisis. If pure distilled water is charged with these gases, under a pressure of 200 pounds, it takes up more of the gases than any other form of water. The Nitrous oxide gives piquancy to the taste, and makes a very palatable drink. When this

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water is taken as a beverage, one pint once in three hours, the results are almost incredible, increasing the strength, appetite and spirits, to a remarkable degree; in this way acting as a valuable prophylactic and curative agent in phthisis, and diseases of the digestive organs, this gas being absorbed into the portal venous system, enters the right side of the heart and thus is carried directly to the lungs. A drug administered by inhalation is absorbed by the vessels of the bronchial tubes and these do not lead into the lung-tissue, but away from it, passing to the root of the lung. And moreover, a volatile drug taken in with the respired air is not actively carried farther into the lung than the normal tidal air, if it is carried so far, so that if it get to the end of the bronchial tube, it would have to diffuse like the rest of the air in order for this result to be accomplished. And this is a strong reason against an antiseptic drug, taken by inhalation, ever reaching the phthisical consolidation of the lung, and as a matter of fact, there is no evidence in favor of phthisical consolidation being beneficially affected by the inhalation of drugs. Then the only scientific way to administer drugs is, either by the *mouth* or *rectum*. And this explains why gases introduced in drinking water, or administered by the rectum, are so efficient. Through the portal circulation, it is all actually poured directly into the lung and there does its curative work in the diseased tissues.

Carbonic Acid Water.—Carbonic acid water is the product of the solution of Carbon dioxide (carbonic acid gas) in water. In such solution there is a chemical union between the gas and the water, molecule for molecule. At the ordinary pressure of the atmosphere, water absorbs about one volume of Carbon

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dioxide, but under a pressure of two hundred pounds, will take up as much as ten volumes of the gas, soda water contains from five to ten volumes of CO_2. Beer, mineral waters, sparkling wines and all effervescing liquors, owe their life to this gas. Carbonated water is a valuable and pleasant water to drink. Like all acids, it tends to excite the secretion of saliva and buccal mucus, and so relieves thirst more permanently than plain water, and it is peculiarly grateful to the stomach, tending to allay nausea and expelling flatus. It increases the rapidity of the absorption of water in the intestinal canal, as is shown by the fact that water containing Carbonic acid is excreted by the kidneys much sooner after it has been drunk than water without it. Carbonic acid is in greater quantities in the large intestine than in the small, and part of the CO_2, after introduction into the stomach, passes into the blood and is excreted by the lungs.

Natural waters charged with CO_2, and drank freely, are a valuable prophylactic in phthisis; and if the CO_2 could be added to all the liquids taken it would greatly facilitate the cure of phthisis. Milk charged with this acid is not only preserved thereby, but many times more valuable. Every hospital for consumptives should be supplied with the whole apparatus necessary for charging all the liquids taken by the patients, witht his gas or with Oxygen gas, associated with the Nitrous oxide. Seventy-five dollars will buy the whole outfit, which would be extremely valuable to the patients. If the patient is troubled with rheumatism, CO_2 is still more called for. The inhalation of CO_2 often acts beneficially in asthma.

Carbonic Acid in Phthisis.—Dr. Hugo Weber de-

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scribes a novel way of treating consumption, in the Berlin. klin. Wochenschrift, Sep. 2d, 1890. This consists in administering a teaspoonful to the patient, of Bicarbonate of soda before meals and following it with a glass of water containing twelve drops of Muriatic acid. There is generated about half a pint (270 cc.) of CO_2 which is gradually absorbed and exhaled by the lungs. Weber reports in some detail nine cases favorably affected by this treatment.

From one to four quarts of carbonated water should be taken daily.

Those that inherit the phthisical diathesis, and those afflicted with phthisis, as well as all lean, thin, spare people, with but little adipose tissue, should be great drinkers of water in its manifold forms. But fleshy, well built people, well padded with fat, do not need so much water and should take it sparingly.

Prevention of Inter-marriages Between Phthisical Subjects.—One of the greatest prophylactics of phthisis known to man, would be the absolute prevention of people predisposed to consumption to marry. This can, and should be done, by an act of Congress. No person, male or female, with a feeble physical make-up, where one, and especially both of the parents have died of phthisis, or is suffering from constitutional syphilis, should be allowed to marry, under any circumstances whatever. We do not hesitate to improve our stock among horses, cattle, sheep, hogs, dogs and fowls, by castration or death of the sickly feeble ones, allowing none to breed but the finest, and those that have every mark of absolute physical health. Now if the same thing was done to man that is done to the lower animals by our National Government, one hundred years from now that fell destroyer, consumption, would be well-nigh

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stamped out, and we would have our land peopled with a set of men and women of such physical health, that all nations would bow down and worship them,

I would have an act of Congress passed, so that it would become a national law and could be enforced, to this effect:

I. Each party wishing to marry should go to a reliable physician and pass a rigid medical examination, and answer, under oath, the following questions:

1. Are you physically a healthy man and woman?

2. Are both of your parents living, and healthy? If one or both parents are dead, what was the cause of their death?

3. Has either, or both, of your parents had consumption? If so, how long, and have one or both died with it? (If one, and especially both of the parents, have died with phthisis, the parties are unmarriageable.)

4. Has one, or both, of the parties ever had constitutional syphilis? (If so, marriage is absolutely barred.)

5. Is either or both, of the parties habitually intemperate? (Intemperance in either or both parties, should preclude marriage.)

II. If both parties are declared physically healthy, a *medical license* is granted and issued, which is to be taken to an *official*, that has graduated in medicine, and after he has examined them the same as the first physician, and they are found physically sound and qualified for matrimonial relations, a *marriage license* is granted.

III. I would allow no one to perform the sacred right of marriage but well educated licensed ministers of the Gospel. No Justice of the Peace, or politician,

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should be allowed to perform this sacred right. The minister should be well drilled at college in all the physical laws pertaining to health, so that he could at a glance form an opinion whether, physically, the parties applying should be allowed to marry. A minister that is found guilty of marrying parties, either one of whom is predisposed to tuberculosis, or has had constitutional syphilis, or is habitually intemperate, should loose his license, and be put out of the ministry.

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DIET.

Diet.—This is one of the most difficult, and at the same time, one of the most practical subjects the physician is called upon to decide in the treatment of phthisis. Shall it be a *vegetable diet*, or *animal diet*, or a *mixed diet?* So far as I am able to judge, a *mixed diet* will prove the most beneficial to the largest number of patients, but many will be found where a *vegetable diet* will prove the most useful. There being such a loss of the potash salts in phthisis, a diet should be selected that would replace this loss, and that will be found in a vegetable diet. Potash is nature's true solvent for urea and uric acid, and this consideration is a strong factor in the selection of a vegetable diet. In all cases where a mixed diet is used, vegetable should greatly predominate over the animal.

Different experimenters have found that a normal food must not consist of one element exclusively; whether nitrogenous, starchy or fatty; further, as no one food contains the different essential principles in the necessary proportions, a mixed diet must be employed, and the nature of this diet must vary with the manner of living, and the climate and the seasons. The necessary Nitrogen and Carbon will be best and most economically obtained from a mixed dietary.

As a rule, animal food should be in the proportion

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of one to four of vegetable. Thus two pounds of bread and three-fourths pounds of beef will supply the necessary amounts of Carbon and Nitrogen which would require over six pounds of meat and more than four pounds of bread alone. Bread would give too much Carbon, and the meat too much Nitrogen. For a healthy man, his food taken in twenty-four hours should contain from 4000 to 5000 grains of Carbon, and from 250 to 3000 grains of Nitrogen. The Nitrogen is furnished from animal diet of albumen, fibrin, casein, legumin, etc. The Carbon from the Hydro-carbons, Carbo-hydrates, starches, sugar, etc.

The dynamic value of a food depends on its richness in easily assimilable proteids, and its calorific value on the quantity of heat it produces when burnt in the organism. The digestibility of a food must also be taken in consideration. Great differences exist in the absorption of different foods; thus, rye bread, potatoes, and green vegetables produce large quantities of fresh and dry excrement; while white bread, fresh meat, and eggs are absorbed to a greater extent, and are therefore more valuable. Fat of butter is easier of digestion than bacon fat, and should be freely eaten by the phthisical. The carbo-hydrates are easily assimilated when contained in white bread, rice and macaroni; but with more difficulty from potatoes, rye bread and turnips, and Nitrogen is more easily absorbed from meat, eggs and animal substances generally, but with more difficulty from rye bread and vegetables. (Rubner.)

The constituent parts of the human body are gaseous, liquid and solid. Of the gases, Oxygen, Nitrogen and Carbonic acid are the chief. These are in a state of solution in the liquids, the largest pro-

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portion consisting of water, holding in solution different acids, salts and organic bodies. Now this explains the great value of the liquids introduced into the system by my method of treatment. When these fluids have commingled with them some of the carbohydrates, they practically contain about all the body is composed of, and are in such a state of solution that the system assimilates them at once, with but little labor on the part of the assimilating organs. Another thing that forces itself upon us, is the fact, that if we take *simple water* and highly charge it with Carbonic acid gas, we have in it alone almost all of the chemical constituents of the human body. No wonder that water constitutes our greatest food. What is food? Any substance capable of replacing any of the body waste, or maintains any vital process. All the tissues being composed of over three quarters water, explains why water is the most important food we have. I would then classify food in the following six classes:

1. Water.
2. **Carbo-hydrates,** *Starches and Sugar.*
3. **Albuminoids,** *Animal Foods.*
4. **Hydro-carbons,** or *Fats.*
5. **Salts,** *Mineral Substances.*
6. **Air** or *Gaseous Food.*

Carbo-hydrates.—Under these are found the *starchy*, *amyloid*, or *farinaceous*, and the *saccharine* elements of our food, and in the treatment of phthisis they occupy the first place as a food to build up the wasting tissues of the body.

Starch consists of Carbon, Nitrogen and Oxygen (having the formula of $C_6N_{10}O_5$) and is found in all cereals used for the food of man; as wheat, oats, barley, maize, rye, rice, buckwheat, peas, beans, pota-

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toes, sago, tapioca, arrowroot, carrots, parsnips, turnips, etc.

Starch is not only the food of man but also of the plant. Take a grain of any cereal, it contains starch, albuminoid matter and earthy salts. When the plant germinates, the starch is converted into sugar, as the plant requires it by the action of the diastaste (an albuminous ferment) as the seedling grows. Man takes for his own use the food that the plant has stored up for its own young.

The carbo-hydrates by the act of digestion, become the *great fuel food* of our bodies. How do they do this?

1. The saliva converts starch into grape sugar.

2. The gastric juice, Albuminus into acid albumates, and then into proteids.

3. The pancreatic juice, Starch into dextrine and grape sugar; Albumens into globulin substance, and then peptone, leucin, tyrosin, aspartic acid; and fats into glycerine and fatty acids, partly saponifying them.

4. The bile (of which is secreted about two and a half pounds every twenty-four hours) assists the pancreatic juice in digesting the fats and acids in their absorption.

5. The intestinal juice completes the digestion. As the more or less disintegrated starch granules pass along the small intestines, they become fully dissolved into grape sugar, which passes into the blood of the portal vein.

6. When the soluble grape sugar, whether derived from starchy or saccharine elements of our food, it matters not, passes into the portal vein, and thence into the liver. Here it is dehydrated, or turned back into glycogen, or animal starch, and stored up for

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the bodily needs. This grape sugar forms the fat, or adipose tissue, of the body. Carbo-hydrates then furnish the glycogen or body-store of fuel in the liver. The liver stores up from each meal so much of glycogen, and gives it off as required. The muscles have also their little stores of glycogen. This insoluble stored up glycogen is given off as required and burnt up as lactic acid in the form of soluble grape sugar with Soda and Lactate of soda; and in this way, the carbo-hydrates become *the great fuel food of the body.*

Starch, sugar and dextrine are easily assimilated, the gums and cellulose with difficulty. As force-producers they possess a very high dietetic value, and as great store houses of potential energy they may be regarded as the intimate, though not necessarily the direct sources of heat as well as muscular energy. The potential energy of the fats, however, is much greater than that of the cardo-hydrates, developing more than twice as much heat.

Albuminoids or Nitrogenous Foods.—The chief of these are the Albumens. The most important single element in nitrogenous food is the albumen. It contains nutrative material in a *condensed* and easily *assimilated* form; its composition is almost identical with the albumens of blood and the animal tissues. Rich albuminous foods are found in the flesh of all animals, fowl, fish, eggs, oysters, milk, etc., and to a smaller extent in most of our cereals. The vegetable albumens are not so rich in Carbon as the animal albumens, but are richer in Nitrogen. This accounts for their less nutrative value and the greater difficulty in their assimilation. They are, however, like eggs and fish, very rich in Phosphorus. It may be stated generally that vegetables are more

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difficult and slower of digestion than most animal foods but when combined with animal in suitable quantities, digestion is much easier and assimilation more perfect. Albuminoids are digested exclusively in the gastric juice of the stomach, of which is secreted every twenty-four hours, from 16 to 31 pounds, or an average of 20 pints, or about 18 ounces per hour. The carbo-hydrates and fats are there untouched. An albuminoid previous to digestion is termed a "proteid." When digested in the stomach a "peptone." This peptone then passes into the intestines and from there into the portal venules, where it is dehydrated and once more made a proteid in the portal blood. When this does not take place properly, the peptone appears in the urine as albuminaria. When the albuminoid matters reach the liver a portion of them is elaborated into the serum-albumen of the *liquor sanguines* for the nutrition of the tissues. Most people daily eat more nitrogenous food than their bodies actually require. This surplus is called the *luxus consumption*. What becomes of this *luxus consumption?* It is burnt up, and oxidized in a descending series as tyrosin, lucin, kreatine, kreatinine, then passing on to uric acid and urea; and so long as the liver possesses the power of converting this *luxus consumption* into soluable urea, all is well. Soluable urea passes out of the *liquor sanguines* in the renal secretion without any difficulty, but not so uric acid; uric acid is the poison of gout, and when an excess of it is formed in the system, lithemia, cholœmia or biliousness supervenes, or the kidneys become injured by the out-put of lithates and Bright's disease is the result. Cholœmia and lithaemia are equally and alike, casually related to the albuminoid elements of our food. Those who lead an invalid or sedentary

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life, should never eat much meat, especially those advancing in age, for most of the diseases which fasten on the body as age approaches, are casually linked with the excessive use of an albuminoid diet. In conclusion, with regard to albuminous food, "it may be stated, in general terms, *that wherever vital operations are going on, their nitrogenous matter is to be found,* the operations of life occurring through its instrumentality. The nitrogenous tissues which are the machines for living actions, have first to be constructed and then maintained. Accordingly, nitrogenous food is required for the construction, as well as the maintenance, of the tissues. Hard work is best performed with an abundant supply of proteids, as this leads to a better nourished condition of the animal machine, and its compound parts, such as muscle, etc., and to keep up this good condition, for work, *a liberal supply of nitrogenous food is absolutely essential.* In addition to supplying the nitrogenous waste, and forming one of the great sources of fat in the economy, *the proteids excite the metabolic activity of the body,* and hence they are not stored up so readily as the fats and carbo-hydrates." (T. C. Cartes, M. D.)

Hydro-carbons or Fats.—The fourth great element of our food is fat derived both from the animal and vegetable kingdoms, and is composed of *stearin, palmitin* and *olein.* The first two being solid at ordinary temperatures, are held in solution by the olein at the temperature of the body. Fat can be readily broken up into a fatty acid, and glycerine. The fatty acids are three, stearic, palmetic and oleic. Stearine is the firmest fat, readily solidifying in a low temperature, palmitin next, while olein still remains liquid. Animal fat contains more stearine than that

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of vegetables. Mutton and beef suet quickly get hard, and the more stearine a fat contains the harder it is to digest.

"Fat is not affected by salivary, nor yet by gastric digestion. It is only when gastric digestion is over, and fat comes into contact with the *bile* and the *pancreatic secretions*, that any change is affected in it. The change is not molecular, like the hydration of carbo-hydrates and albuminoids; but is merely an emulsification, i. e., a division into minute particles. These small particles are fine enough to enter the mouths of the lactels in the nitestinal villi, which may be said to eat the fat globules. From thence the emulsionized fat passes on to the lymphatics. The history of fat in the body after this is obscure; we know that some of it is taken up by the tissues, and the rest is burnt up as body fuel (and passes off as CO_2). There is no proof of fat being stored up in the body as fat. Indeed, Ebestein has advocated the substitution of fat for carbo-hydrates in the treatment of obesity; and that, too, with success.

"The difficulty with fat lies with the stomach. A delicate fastidious stomach is offended by the presence of fat in it; and this reacts upon the palate. Some stomachs will tolerate cold butter, which promptly and pronouncedly take offense at warm fat. Rancid fat is objectionable to civilized stomachs, and compels the most scrupulous attention to all culinary utensils. With some persons, fat turns rancid in the stomach by the formation of an acrid acid-butyric, causing heart-burn. There is a growing dislike to fat, especially animal fat, at the present time. Many children will no more eat fat than they will a cat. They will turn with loathing from the sweet pieces of fat on their plates, yet they will read-

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ily swallow fishy cod-liver oil. Their choice is instinctive, and evidently linked with the fact that they can digest the one and not the other." Intelligent persons are now eating fat because they know it is good for them. Whenever there is any tendency to tubercle, the individual should learn to eat fat, just as a sea-faring man learns to swim. As a physician to a Chest Hospital, I have learned to dread the announcement that fat is not longer taken, especially if the individual is of a strumous build, with a small narrow chest. In my opinion of a considerable area of affected lung, where the digestive powers keep up, is less fraught with evil, and less prognostically significant, than *intractable wasting* with little disease in the lung." (J. Milner Fothergill, M. D.)

"Origin and source of the fat in the organism: Part of the fats is absorbed as such in the intestines, in entering the capillaries in the form of scarcely saponified glycerides, that are subsequently transformed into alkaline soaps. But they also arise in the body at the expense of the albuminoids. It seems doubtful whether any of the fat is derived directly from the sugar absorbed, though this is asserted; but it is probable that the accumulation of fats occurring on a mixed diet, rich in sugar, is due to the conversion of the sugar into fat, but rather to the protection thus afforded against the oxidation of the fats that, however, a large proportion of the fat of fattened animals is not derived from ingested fat, but directly or indirectly from the carbo-hydrates, as well as the nitrogenous elements of the food, particularly when the latter are in excess, seems most probable, and there is no doubt but that a combination of nitrogenous food and saline matter, together with carbo-hydrates, conduces most to the produc-

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tion of fat in the organism. The carbo-hydrates play a distinct part in the formation of fat in the carnivora and herbivora." (T. C. Charles, M. D.)

The fats that are not stored up by the tissues requiring them, disappear probably by direct oxidation, being transformed into water and Carbonic acid gas, evolving much heat or force in potential form. The amount of Carbonic acid gas given off during exercise is much greater than during rest. If we wish to increase the weight of the body and add to its constituents, we must combine fats with the albuminates, as these given alone only lead to increased weights: But if we combine fats with albuminates, in proper proportions, an increase of both nitrogenous and non-nitrogenous constituents of the body can be maintained for a long time. Fat economizes the albuminous elements of the food, and checks the waste of the albuminous tissues. Fat enters into all the tissues, and by its oxidation, it yields muscular force and heat and it is largely consumed in muscular exercise. The capacity of fat being stored up as adipose tissue makes it a reserve store house of force-producing and heat-generating material to be used when great muscular exertion is required. "The capacity of a material for heat production depends upon the amount of unoxidized Carbon and Hydrogen it contains; and of all elementary materials, *the fats* hold the highest place in this respect. While in the starchy, saccharine and such-like materials, a sufficient amount of Oxygen exists in the compound to oxidize all Hydrogen present, leaving only the Carbon, in an oxidizable condition; in the fats not only is the Carbon, but also the chief of the Hydrogen, in an oxidizable state."

"To illustrate the difference existing, it may be

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stated that starch contains, in round numbers, forty-five per cent. of Carbon, and six per cent. of Hydrogen, making fifty-one per cent. of Carbon and Hydrogen together. The remainder consists of Oxygen, amounting to forty-nine per cent. of the whole. Sugar, and gum likewise, in round numbers, contain forty-three per cent. of Carbon and six per cent. of Hydrogen, making forty-nine per cent. of Carbon and Hydrogen together, and leaving fifty-one per cent. to be made up by Oxygen. Fat, on the other hand, contains about ninety per cent. of Carbon and Hydrogen —seventy-nine per cent. of Carbon and eleven per cent. of Hydrogen, and ten per cent. of Oxygen.

"According to what is here shown, a given quantity of fat will have the power of appropriating about 2.4 times as much Oxygen as the same quantity of starch; or stated in other words, will develop about 2.4 times as much heat in the process of oxidation and hence has about 2.4 times as much value as a heat-producing agent."

"Actual heat, expressed in units (the unit representing the heat required to raise one gramme (15.432 grains) of water 1° Cent. or 1.8° Fahr.) developed by one gramme when burnt in Oxygen.

	HEAT UNITS.
Beef fat	9069
Starch (arrow root)	3912
Cane (lump) sugar	3348
Commercial grape sugar	3277

"Looking at this difference in the relative value of fatty, starchy and saccharine matters as heat producers, we see the wisdom of the instinctive consumption of food abounding in fatty matter by the inhabitants of the Arctic regions. The Esquimaux and

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other dwellers in the frigid zone, devour with avidity the fat of whales, seals, etc., and find in this the most efficient kind of combustible material. In the tropics, on the other hand, the food consumed by the native inhabitants, consists mainly of farinaceous and succulent vegetable material. On account of the elevated temperature of the surrounding air, less heat is required to be produced within the body, and a less efficient combustible material is able to supply what is needed for the maintenance of the ordinary temperature.

"The adipose tissue fills up interstices between muscles, bones, vessels, and the other anatomical structures, and by its accumulation under the skin, it gives a regular and rounded form to the outer surface of the body. As a bad conductor of heat, the layer of adipose tissue beneath the skin contributes toward retaining the animal warmth. This function it most conspicuously fulfills in the aquatic warm-blooded animals, such as the seal, porpoise, whale, etc., in which a coat of hair would prove of no service. The very great thickness of the subcutaneous layer of adipose tissue met with in these animals is evidently designed to meet the demand occasioned by the unsuitableness in this particular instance of the ordinary provision.

"Accumulated with the vesicles and susceptible of re-absorption into the blood, the fat forms a store of force-producing material to be drawn upon as circumstances may require. Hence it is that life is sustained longer in a fat animal under abstinence from food and with a supply of water, than in a thin one." (F. W. Pavy, M. D.)

Animal fat is very much easier of digestion than the vegetable fat. When fat is not easily assimilated

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by the system, it is owing to the secretions of the liver and pancreas being in some way defective. In these cases by the addition of powdered pancreatin and inspissated ox gall, one hour after eating, we can often so aid the digestive organs that the fats will be readily emulsified and assimilated. Fat cannot be digested and absorbed into the system without the emulsifying aid of the bile and pancreatic juice.

Cod-liver Oil—Oleum Jecoris Aselli.—This is obtained from the liver of the common cod; the process is thus described by Dr. Garrod: "The livers are collected daily, so that no trace of decomposition may have occurred; carefully examined, so as to remove all traces of blood and impurity, and to separate any inferior livers; they are then sliced and exposed to a temperature not exceeding 180° Fahr. till all the oil is drained from them. This is filtered, afterwards exposed to a temperature of about 50° Fahr. in order to congeal the bulk of the margarine, and again filtered, and put into bottles well secured from the action of the air." The best oil comes from Norway.

Cod-liver oil, being the only agent in which the old school have any confidence as a curative agent in tuberculosis, let us first see what the oil really contains.

Dr. Jongh found the principal constituents of these oils to be *oleate* and *margarate* of *glycerine*, possessing the usual properties, but they also contained *butyric* and *acetic acid*, the principal constituents of the bile as *fellenic*, *cholic* and *billifellinic acids*, and *bilifulvin*, a peculiar substance soluble in alcohol, a peculiar substance soluble in water, alcohol, or ether; *iodine*, *chlorine*, and traces of *bromine; phos-*

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phoric and *sulphuric acids; phosphorus; lime; magnesia, soda* and *iron.*

These were found in all the varieties, though not in equal proportions in all, yet it is quite uncertain whether the difference had any relation to their degree of efficacy.

This analysis gives us a compound of twenty different remedies, all of which, it will be seen, act especially upon the *great sympathetic* or *vegetative nervous* system, the *grand centre* for the action of the *tubercular poison*, and, it will be seen, are the principal remedies used by our school for the cure of tubercular consumption. This analysis also gives us an explanation how cod-liver oil cures consumption. First, it holds in solution a fine attenuation of lime, Iodine, Phosphorous, Bromine and a large number of other valuable remedies, and it is nonsensical to think they do not act medicinally.

Our preparations of the same remedies in which we all have such unbounded confidence, contain far less medicine of each one of the ingredients, at the 30th and 200th attenuation, than the oil. We would like to see the chemist who would give the amount of Iodine the 30th or 200th centesimal attenuation contain to the grain or ounce. We are certain that they do act medicinally in those attenuations. A chemist can tell us the quantity of Iodine contained in an ounce of oil, but he cannot tell in an ounce of the 200th attenuation of Iodine. Consequently, we must conclude from this, that the beneficial influence exerted by cod-liver oil in phthisis, is to a large extent medicinal. Secondly, it is also highly nutritious and easily assimilable food. In all ages oleaginous substances have been esteemed highly as curative agents in consumption, whether their action was to be at-

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tributed to their medicinal or to their nutritious properties. We now see that it supplies nutriment in a concentrated form, and at the same time holds in solution medicines that are homœopathic to the tubercular diathesis.

Dr. C. J. B. Williams, in his late work on Pulmonary Consumption, says: "After a quarter of a century's experience, it is the only agent in any degree deserving the title of a remedy in this disease. Its mode of action is still a matter of uncertainty, but we can at least offer some reasonable conjectures. That it is in itself a nutriment cannot be doubted, and that its nutritious properties go farther than to augment the fat in the body is proved by the well ascertained fact that the muscles and strength also increase under its use. In fact, it has been proved to increase the proteinaceous constituents of the blood except the fibrin which is diminished; in truth, the beneficial operation of cod-liver oil extends to every function and structure of the body. In cases most suitable for its use, there is a progressive improvement in digestion, appetite, strength and complexion; and various morbid conditions perceptibly diminish. Thus purulent discharges are lessened, ulcers assume a healthier aspect, colliquative diarrhœa and sweats cease; the natural secretions become more copious, the pulse less frequent. It is difficult to comprehend how it can produce such marvellous salutary effects. [Through the vegetative nervous system it produces these marvellous effects.] When we remember that in a teaspoonful of oil we are administering a dose of Iodine equal to a drop and a half of its 3d decimal dilution, and that we are generally giving it in cases to which the drug is thoroughly homœopathic, can we doubt that it exerts a curative action; if we dis-

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believe this, we have no reason for believing in the action of infinitesimals anywhere. Moreover, were it the oleaginous matter *per se* which cures, why should all attempts to find a substitute for the oil of fishes be so unsuccessful?"

In cases that are benefited by the use of cod-liver oil, the nutrition of the body is at fault, and we find the loss of flesh or emaciation a prominent symptom, with marked debility, or we may have enlargement of the lymphatic glandular system, the swelling of the cervical or sub-maxillary glands. Such cases are sure to be benefited by the oil, especially if in little children.

There are three varieties of oil in use: the dark brown; a brown, and a pure, pale oil. The latter is the only kind that ought to be used for medicinal purposes. The strong smelling and dark colored oils owe their offensive properties to the partial decomposition and putrefaction that has taken place before the oil is taken from the livers. Speaking about the various kinds of oil, Dr. Williams says in his work on consumption: "It was not until the pure, pale oil was brought under my notice that the difficulties in administering it gave way; and during the last twenty-five years I have prescribed it (the pale oil) for between twenty and thirty thousand patients, and with such success that it was taken without material difficulty by about ninety-five per cent. of the whole number, and of those who thus took it, full ninety per cent. derived more or less benefit from its use. This experience, which is in accordance with that of many of my professional friends, is at least quite as strong as any that could be adduced in favor of the brown or impure kind of oil, and it does seem absurd to recommend the exhibition of the remedy in its offen-

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sive form, when the pure fresh oil has been proved to be at least equally efficacious."

To get the full benefit of the oil, its use must be persevered in for at least several months, and some patients will find it their staff of life and will have to continue it their whole lifetime.

To preserve the oil, the bottle should be well corked and kept in a cool place; the oil should not be exposed to the air any longer than is necessary to take it.

Dr. Meyhoffer says: "Cod-liver oil justly merits the high reputation which it has acquired in correcting those deficiencies of nutrition commonly comprehended in the terms of scrofulosis and tuberculosis. In patients exhibiting a strumous diathesis of a slender and lean figure and thin transparent skin, we generally find combined frequent weak pulse, great excitability of the nervous system, with high specific gravity of the urine—all signs of an accelerated metamorphosis. It is in this condition that the action of cod-liver oil has obtained its anti-scrofulous fame, in a short time after its use the angular forms acquire more roundness, and the general susceptibility as well as the morbid phenomena gives way to its influence. Scrofulous individuals, however, who exhibit a fatty, puffy, leuco-phlegmatic body, swollen nose and upper lip, slowness of the cardiac contraction, defective irritability of the nervous system, and low specific gravity of the urine, far from being benefited from cod-liver oil are the very victims who have been made to swallow it by quarts, and to no purpose. The reason of this is obvious; fat requires nearly double the amount of oxygen for its combustion (100:292.14) to that demanded by albumen (100:153.31), and as it evinces a greater tendency to generation of acid

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than the latter, acts, when introduced into the organism the part of a moderator to the metamorphosis of nitrogenous substances. On the other hand, that part of the oleaginous matter which has not furnished its share towards the production of animal heat by combustion, does so by its accumulation under the cutaneous surface, or enters as a necessary element into the formation of cells. It is thus evident that cod-liver oil can only be of service when the destructive, nutritive process prevails over the constructive one, and that otherwise its agency must rather increase than diminish, a lymphatic tendency of constitution.

But the virtues of this animal product are, by a great number of physicians, attributed in a measure to the Iodine contained in it. There can be no doubt as to the salutary influence exercised by this metalloid over some special scrofulous affection; but this does not destroy the fact that cod-liver oil, like any other fatty substances (the fat of dogs is a popular remedy in Germany for scrofula and phthisis), produces its best effects on lean persons who, as physiology teaches, consume more Oxygen and excrete Carbonic acid and bile than fat ones, while on those who show a disposition to the formation of adipose tissue, it effects a contrary result to that which is desired, in spite of the Iodine which it contains. Cod oil is a specific only in a limited number of morbid conditions; in the majority of instances it derives its importance from its value as a nutritive agent arresting a preternatural waste."

Dr. Walshe, an allœopathic physician, whose authority on this subject no physician can outrank in any school, draws the following conclusions:

(1) That cod-liver oil more rapidly and more

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effectually induces improvement in the general and local symptoms than any other known substance.

(2) That its power of curing disease is undetermined.

(3) That the mean amount of permanency of the good effects of the oil is undetermined.

(4) That it relatively produces more marked effects in the third than in the previous cases.

(5) That it increases weight in favorable cases with singular speed, and out of all proportion to the actual quantity taken, that hence it must, in some unknown way, save waste and render food more readily assimilable.

(6) That it sometimes fails to increase weight.

(7) That in the great majority of cases where it fails to increase weight, it does little good in other ways.

(8) That it does not relieve dyspnœa out of proportion with other symptoms.

(9) That the effects traceable to the oil in most favorable cases are: increase of weight, suspension of colliquative sweats, improved appetite, diminished cough and expectoration, cessation of sickness with cough, and gradual disappearance of physical signs.

(10) That in some cases it cannot be taken, either because it disagrees with the stomach, impairing the appetite (without being itself absolutely nourishing), and causing nausea; or because it produces diarrhœa.

(11) That in the former cases it may be made palatable by associating it with a mineral acid; and in the latter prevented from affecting the bowels by combination with astringents.

(12) That intrathoracic inflammations and hæmoptysis are contra-indications to its use, but only temporarily so.

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(13) Diarrhœa, if depending on chronic peritonitis or secretive change, or small ulcerations in the ilium is no contra-indication to the use of the oil; even profuse diarrhœa caused by extensive ulceration of the larger bowel is not made worse by it.

(14) That the beneficial operation of the oil diminishes, *cœteris paribus*, directly as the age of those using it increases.

(15) That the effects of the oil are more strikingly beneficial when only a small extent of the lung is implicated in an advanced stage, than where a relatively large area is diseased in an insipient stage.

(16) That where chronic pleurisy or chronic pneumonia exists on a large scale, the oil often fails to relieve the pectoral symptoms.

(17) That it often disagrees, when the liver is enlarged and probably fatty.

(18) That weight may be increased by it, the cough and expectoration diminished, night sweating cease, the strength which has been failing remain stationary under the use of the oil and yet the local disease be all the while advancing. "Singular proof," says Dr. Walshe, "of the nutritive power of the agent," and, we may add, of its sufficiency as a medicine. "This admirable exhaustive summary of the knowledge which is possessed of the subject to which it relates, confirmed, as it has been by the conclusion of competent observers, shows a wide difference between the anticipations which were indulged respecting the virtues of cod-liver oil and the sober realities of experience. But enough remains to prove that among the remedies that have been proposed for pulmonary consumption none can be compared with its efficacy. More than any other, it mitigates the symptoms of the disease and delays its march; while in some cases

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it appears permanently to arrest the degeneration of tubercles already deposited, and so to improve the nutrition as to prevent the formation of new ones." (Stille.)

Dr. H. C. Wood says: "There can be no doubt that consumption often commences with catarrh, and is often developed slowly, as the result of frequently "catching cold." Whenever a patient is feeble, pale, somewhat anæmic, complains of his liability to catch cold on the slightest exposure, even though no local disease exists anywhere, or rather because no local disease exists anywhere, there is cause for alarm; and it is of the most vital importance that the patient be put upon a tonic treatment, whose basis is cod-liver oil.

It remained for Reed and Carnrick to bring out the *perfection of all cod-liver oil preparations*, in the form of *Peptonized Cod-liver Oil and Milk.* It is partially predigested, and is therefore more easily digested and assimilated, especially by weak and enfeebled stomachs. Eructations are much less likely to follow than when any other form of the oil is taken. It contains fifty per cent. of pure Norwegian Cod-liver oil, the remaining percentage is composed of milk and an emulsion formed with Irish moss. No gums are used in its manufacture. But the great feature of this preparation is this: *it mixes readily with water*, and makes a pleasant drink, and in this way any child or adult can easily take it; and we not only get the benefit of the oil, but we get the fat contained in the milk, and that *greatest of all foods, water.* I am delighted with this preparation of cod-liver oil and milk, for it so aids me in giving liquid food to the phthisical. *Fat, Oil and Water* are the only deadly enemies that the poison of phthisis has. This poison

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flourishes and runs riot in a tall, slim, feeble, emaciated and poorly nourished person, but a stout, well nourished, fleshy person, well padded with fat, causes the *poisonous bacillus tuberculosis to turn pale, wither and die.*

DOSE.—One tablespoonful, dissolved in a tumbler full of water, and drank four times a day.

Caution.—Cod-liver oil "should not be administered indiscriminately during the persistence of acute febrile symptoms, congestion, hemorrhages, or any active form of disease; digestion being then impaired, and the mucous membrane irritable, the oil is only likely to increase the disorder. The sphere of cod-liver oil is to remove *exhaustion* and impart general tone; this is best accomplished when active morbid processes and local irritation have subsided, for then the system is in a condition to appropriate a larger amount of nourishment." (Dr. Ruddock.)

Exhibition.—Many people and even children have no trouble in taking cod-liver oil, in fact cod-liver oil is taken better by children than by grown people; but with some, the sweetest oil is taken with great difficulty; those who are so sensitive should take it in the form of *capsules* or *inunction.*

One of the best methods I have ever found to administer it is for the patient to suck the juice of a lemon, or chew a little of the lemon skin before taking the oil, and the same after; the taste of the oil is generally all gone in one minute after.

Another good way is to take it floating on a weak solution of *Phosphoric acid,* or an infusion of *orange peel,* the quantity of the vehicle should not exceed a tablespoonful, with a teaspoonful of the oil, which should be gradually increased to a tablespoonful for adults and half the quantity for children.

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The oil should be taken morning and night directly after eating. Experience has taught us that if taken directly after eating, it is not so apt to disagree, and rises much less, leaving the appetite free for the next meal. If taken on an empty stomach it leaves for hours a rancid, unpleasant taste, with frequent eructations, tasting of the oil.

Children generally take it very readily; if they should not like it, the best way is to form an emulsion with the yolk of an egg, or mucilage, and flavor it with some syrup, or if the child is very young, the first three decimal triturations can be given in many cases with excellent results, at the same time it can be used on the child by *inunction*. Better still, give *Peptonized Cod-liver Oil and Milk*.

Dr. Hempel says: "If the stomach should not be able to retain the oil, a minute portion of common salt taken both before and after the dose of oil, will sometimes enable the stomach to bear this remedy when all other devices fail."

Dr. Ruddock says: "Probably the best method of rendering the oil palatable is to have it made up into bread, as it is then scarcely tasted. The proper proportions is two to four tablespoonfuls of the oil to one pound of dough. Patients to whom we have recommended this method of taking the oil, assure us that while pleasant and digestible, it is as efficacious taken in this as in any other way. Small pieces of ice in each dose of oil also renders it almost tasteless. Malt is another excellent vehicle to administer this oil in.

"Its assimilation is promoted and its beneficial action greatly enhanced by the addition of ten drops of the first solution of *Iodium* to each pint of oil. This addition is especially recommended in Phthisis,

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Pulmonalis and Atrophy. Claret is another vehicle for cod-liver oil. The oil should be poured upon the wine so that it does not touch the glass, but floats as a large globule; in this way it may be swallowed untasted."

"Take one orange and divide it into two equal parts; squeeze the juice of one-half into a cup; pour the oil upon it, then squeeze the juice of the other half very gently on the oil. By swallowing the whole cautiously, not the least taste of the oil is experienced." (Lancet.)

Dr. Buchner, in his essay on Air and Lungs, "Adverts to the fact that in England they burn cod-liver oil in several lighthouses, and that a number of lighthouse keepers, who had been threatened with phthisis, before entering upon the duty above mentioned and who inhaled day after day the air of the lantern impregnated with the volatile parts of the oil, became fleshy and robust. I have acted on the above hint for five or six years past. In all my prescriptions of cod-liver oil I have directed the inhalations of the vapors arising from *gently* heated (not burned or scorched) crude cod-liver oil, and have in more than one case, seen happy results. I direct my patient to fill a saucer with the crude oil, place the saucer over a tin dish filled with sand, and heat the bottom of this either by stone or other convenient means. To some the effect is very soothing and grateful. I remember only one instance in which the inhalation of the fumes was at once very distasteful and nauseating, that of a young lady whose health failed repeatedly whenever she lived in New Bedford (near salt water), and gained on her going West to Illinois." (G. F. Matthes.)

I have tested the fumes of the oil as given above, and am pleased with its action. Inhaling the fumes

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all night during sleep will be found of much value in the first stage of phthisis.

As to the kind of diet the patient should use while taking the oil Dr. Williams says: "With some individuals the oil agrees so well and so much improves their digestion, that they require little or no restriction in diet, but this is not the case with the majority. The richness of the oil does prove more or less a trial, sooner or later, (such persons should take the Peptonized Cod-liver Oil and Milk) to most persons, and to diminish this trial as much as possible, it obviously becomes proper to omit or reduce all other rich and greasy articles of diet. All pastry, fat meat, rich stuffing and the like should be avoided, and great moderation observed in the use of butter, cream and very sweet things. Even milk in any quantity is not generally borne well during a course of oil, and many find malt liquor too heavy, increasing the tendency to bilious attacks. A plain nutritious diet of bread, fresh meat, poultry or game, with a fair proportion of vegetables and a little fruit, and a moderate quantity of liquid at the earlier meals, commonly agrees best, and facilitates the exhibition of the oil in doses sufficient to produce its salutary influence in the system."

Salts—Mineral Substances.—"These are of great importance, and are as essential to nutrition as the albuminates. There is no tissue that does not contain lime, chiefly in the form of the Phosphate, and it would seem that cell growth cannot go on without it, indeed Calcium Phosphate is the most abundant salt in the body, seeing that it forms more than one-half of our bones. Calcium carbonate occurs associated with this Phosphate, but in relatively much smaller quantity. Sodium chloride is also a very

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important salt, which likewise occurs in all the tissues and fluids of the body. It plays a very important *role* in promoting the diffusion of fluids through membranes, and its presence is necessary for maintaining the globulines in solution. It is absolutely necessary to existence, and its entire withdrawal from food would be speedily fatal. (The want of common salt often causes albuminuria). Rather more than 200 grains are secreted daily, chiefly by the kidneys. It is a matter of common experience in the treating of cattle, that the addition of common salt to their food greatly improves their condition.

The Phosphates of Sodium and Potassium are also important salts. The alkaline reaction of the blood-plasma, and some of the other fluids are due partly to these alkaline phosphates. The acid sodium phosphate is the chief cause of the acid reaction of the urine. Sodium carbonate and bi-carbonate are also found in the blood-plasma; they are ingested in small quantities in the food, and they are partly formed in the body from the decomposition of the salt of the vegetable acids. They play an important part in the blood in carrying the Carbonic acid from the tissues to the lungs.

Sodium and potassium sulphates occur in small quantity in the body, and are partly derived from the oxidation of organic substances containing Sulphur. Potassium chloride is widely distributed, and is found especially in the closed blood corpuscles and in muscular tissue. Magnesium phosphate occurs together with Calcium phosphate, but in much smaller amount; it is probably essential to the growth of some tissues. "Iron is an essential constituent of hemo-globin, and therefore, of the red blood corpuscles. It is found also in striped muscle and in other tissues in minute

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quantity." The two alkalies, Potash and Soda, have a different distribution in the body, and one cannot supply the place of the other. The Potassium salts exist especially in the formed tissues, as the blood corpuscles and muscular fibre, and the sodium salts are found more abundantly in the intersticial fluids; so in the blood, Sodium and the Chloride are found especially in the plasma and Potassium and the Phosphates in the corpuscles.

"The Chlorine of the Chlorides would appear to be easily set free in the body, so that it can combine with Hydrogen and form a powerful action, having a special solvent action on albuminates. The Sulphur and the Phosphates of the tissues appear to be introduced as such in the albuminates.

"All these mineral substances are introduced into the body as constituent parts of the various ordinary articles of human food, animal and vegetable, with the exception of Sodium chloride which is usually added to the food in greater or less amount in addition to what they may themselves contain.

"Certain salts such as the Lactates, Tartrates, Citrates, and Acetates, become converted into Carbonates within the body and confer upon the system that alkalinity which appears to be necessary to the integrity of the molecular currents. The state of malnutrition which in its highest degree we call scurvy appears to follow inevitably on their absence; and as they exist in fresh vegetables it is a well known rule of dietetics to supply these with great care, though their nutritive power otherwise is small.

"Rabbateau observed that the addition of 150 grains of Sodium chloride to the daily rations increased notably the amount of urea excreted; it would seem therefore, to promote the metabolism of

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the albuminates; it acts probably simply by stimulating the digestive functions, and probably increasing the acidity of the gastric juice; it is itself almost wholly illiminated in the urine.

"The utility of adding Phosphates to food with a view of increasing its nutritive qualities has been warmly discussed and it has been pointed out as a proof of their inutility that the soluble Phosphates so given, are eliminated in their totality in the urine and the insoluble ones in the fæces, but as has been argued by Dujardin-Beaumetz, the same happens with regard to Chloride of sodium and it does not follow because of this that it has no influence on nutrition. The favorable action of the Phosphates soluble or insoluble, which is certainly at times absorbed is probably due, as he suggests, either to a regulating action on the functions of the alimentary tube, or to the acid elements they convey into the stomach, or to some other indirect action. As a rule, we take in with our food a far larger quantity of salt than is necessary for the replacement of the tissues. The excess is excreted with the urine and only when an increase of the body weight occurs is any large amount of salts retained in the body." (I. Burney Yeo, M. D.)

A good illustration of the value of the body salts is furnished by watching the effects of arresting the night sweats of phthisis. As soon as the out-pouring of the salts in the sweat is checked, the appetite returns, and soon the pallor of the features give way to the hue of returning health. The effect is often almost magical.

The most complete food we have is milk. Next to that is the egg. In them exist besides the organic principles all the inorganic matter, including both

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saline and water that is needed to build up the human organism.

In the preparation of food for human consumption the natural article is greatly depreciated in nutritive value by the abstraction in boiling, not only of some of its soluble portion, but of much of its nutritive salts. Roasted meat on this account is of more value than when boiled, without the meat is made into a soup. In the boiling of vegetables, nutritive principles, and especially the salts are removed by the water. The preparation of flour leaves the product much inferior to the grain from which it is derived. Both the saline and nitrogenous matter contained in the wheat are chiefly found in the outer or tegumentary part of the grain and they are usually thrown off into the bran. Magenda has proved by experiment that a dog dies if fed on white bread, while its health does not suffer at all, if its food consists of brown bread, or bread made of unbolted flour. We should consume the whole of the grain to obtain all the nutritive principles we require. Cracked wheat should be eaten largely by the phthisical. If the great majority of mankind did not live on a mixed diet of animal and vegetable food, sickness and death would soon be developed, and man would be destroyed from the face of the earth.

Gaseous Food—The Atmosphere.—Composition of atmospheric air.

Gas	By weight	By volume
O	23.015	20.96
N	70.985	99.02
CO_2	Trace	0.030.034

Besides the above it contains aqueous vapor, Ammonia and organic matter. Oxygen forms 20.96

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per cent. by volume of the gaseous mixture; and this proportion is preserved in all parts of the atmospheric ocean. A certain small amount of the O of the air exists in the form of Ozone, a peculiar modification of Oxygen, not yet understood. Oxidation goes on more rapidly when Ozone exists in the air than it does with Oxygen alone, and it is said to destroy the volatile substances which are evolved during putrefaction. The atmosphere is the only gaseous food required by animals and man, and the necessity for its Oxygen is *absolute* and *continuous*. When the mixed gases of the air are drawn into the lungs a portion of the Oxygen is absorbed by the blood, and in the circulation, unites chemically, with the Carbon, Nitrogen and Hydrogen of our food, forming chemical compounds, called Carbonates, Nitrates and Hydrates. Some of the compounds go to form part of the substance of the body, but the major portion of them after producing heat, leave the body as Carbonic acid and water. Chemically speaking, the living body is a great oxidizing machine, constantly burning up its own substance and every act of man, and even each unconscious change within the body, is accompanied by a consumption of Oxygen. The quantity of air consumed when compared with our other food is large; for an adult, the average being 360 cubic feet or about 2000 gallons daily, which would weigh about twenty-five pounds.

Nitrogen.—This being the largest constituent of the air, it must play an important part in the nutrition of the body, instead of being, as many think, only a dilutent of the air. God never makes anything but for use. Notwithstanding up to the present time its real functions are not fully known, one thing we do know; that is, if the supply of Nitrogen be cut

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off from the body, its various functions languish; but if we desire to increase the energies of the body, Nitrogen must be supplied, without the participation of the Nitrogenous bodies, no oxidation or manifestation of energy is possible. The active principle in the various secretions of the body is Nitrogen. Nitrogenous food develop and maintain the tissues in their secretions in the body. It has been proved that the elimination of urea in the urine is in proportion of Nitrogenous food eaten; and it is therefore certain, that the Nitrogenous alimentary principles must undergo such chemical changes in the system as to result in the production of urea. Nitrogen, therefore, plays an important part, in the absorption and utilization of Oxygen in the system. Electricity transforms nitrogen into Ammonia, and Nitric acid, and thus it becomes assimilated by the vegetable kingdom.

Aqueous Vapor.—This is always present in the air, but it varies greatly in amount, increasing with the increase of temperature. All air breathing organisms would perish were the humidity of the atmosphere entirely removed. It is a physiological necessity to the existence of a man's life. If the air be too dry, it irritates the respiratory mucous membrane. If too moist, there is a disagreeable sensation; and if it be too warm, a feeling of closeness. Hence the air should be saturated with watery vapor to the extent of about 70 per cent. The air in mid-summer contains three times as much watery vapor as it does in mid-winter, and the moisture is greater with a south and west wind, than with a north and east wind.

Ammonia.—This eminates and is diffused from putrefactive processes in progress on the surface of the earth. It is also produced from the Nitrogen of the air by electric agency, as during a thunder storm.

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The quantity in the air varies, but it averages about 1 grain to 23,000 cubic feet. Rain washes the ammonia from the air to the surface of the earth, and in a rainfall it may always be detected and measured, and its quantity is increased during thunder storms, and this ammonia is of great use to vegetation.

Carbonic Acid.—This is produced by the oxidation of Carbon in dead and living tissues. The average amount found in the air is about four volumes of Carbonic acid to 10,000 volumes of atmospheric air. Its percentage varies with the local causes which determine its production. The diffusive power of gases, and the wind, tend to equalize the percentage. Thus it is greater in the streets and alleys of a city than in the country, and greater in a damp atmosphere before rain has fallen, than in the air in the same locality after a rain storm. There is more Carbonic acid in the air in summer than in winter by about one-half, its sources being organic decomposition occurring in the soil, animal respiration and the combustion of fuel; the greatest quantity of the gas is found near the surface of the ground. Carbonic acid is harmless of itself, unless it is in very unusual quantities, but it may carry with it from a damp soil, miasma and organic matters that would make it a poison to organic life. Carbonic acid from fuel is generally accompanied by Carbonic oxide and Sulphurous acid, which become very deleterious. Carbonic acid from animal respiration is accompanied by organic exhalations, which is well known to cause headache, febrile action and even phthisis, when the exposure is continuous. "During the English war in India, in the last century, 146 prisoners were shut up in a room scarcely large enough to hold them. The air could enter only by two narrow windows. At the end of

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eight hours but twenty-three prisoners remained alive, and those were in a most deplorable condition. This prison is well called the 'Black Hole of Calcutta.' Percy relates that after the battle of Austerlitz 300 Russian prisoners were confined in a cavern, where 200 of them perished in a few hours. The stupid captain of the ship Londonderry, during a storm at sea, shut the hatches. There were only seven cubic feet of space for each person and in six hours ninety of the passengers were dead." This teaches us that the breath exhaled is laden with Carbonic acid and organic matter, that should never be re-breathed and that our living and sleeping rooms cannot be too well ventilated.

Organic Matter, such as bacteria, miasmas and exhalations from contagious diseases in the sick, in ill-ventilated rooms, adhere to the walls and the various textures in the room with great tenacity and not only require time, but anti-septic means to dissipate them.

The clearness of the atmosphere after a rainstorm is a matter of common observation, and can be readily understood. The impurities of the air are washed down to the surface of the earth; and in this way, rain water becomes the sewage of the atmosphere.

Fresh air is one of the most abundant things in nature, and costs nothing, yet it cannot be doubted that thousands of people, especially those that live a sedentary life, and spend a large proportion of their time indoors, have their health injured, their working capacity greatly diminished and their length of days shortened, by an insufficiency of air. They are literally starving to death for this form of food.

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WATER.

HYDROGEN, TWO VOLUMES; OXYGEN, ONE.

Water.—The uses of this agent in disease have been known and valued from the commencement of man down to the present age. But its full therapeutic value is far from being exhausted. Every year something new of its uses in disease is being found out, and now I have the pleasure to announce one more clinical use of this great agent, and that is, its power to cure *pulmonary tuberculosis* in man, a disease that is said to have destroyed one-eighth of the human family, and is dreaded by the physician more than any other disease that he has to do battle with, because death always comes out victorious.

Before giving this *new use of water* in the treatment of pulmonary tuberculosis, it will be beneficial to first show what part water occupies in the human body, and what are its uses in the animal economy. The chemical constituents of the human body, when dissolved into its original elements, as every physician is well aware, *contain 70 per cent. of water.* That is to say, if a man weighs 200 pounds, one hundred and forty of this is water. This one fact I wish to have fully understood, for it illustrates fully why my new method of treatment is so successful, and is the *real* and *only scientific* way to treat tuberculosis. T. Cranstonn Charles, M. D., in his Elements of Physiological Chemistry, says: "Water forms about

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70 per cent. of the adult and 88 per cent. of the embryo, and is the medium in which the chemical (biological) changes of the organism occur. In the accompanying table the average proportion of water in several of the tissues is given:

	PER CENT.		PER CENT.
Lymph	93-96	Brain	75
Chyle	90-95	Cartilage	67-73
Blood	78	Bones	13
Kidneys	82	Teeth	10
Nerves	78	Enamel	0.2
Muscles	76	Lungs	79.6

Salts.—The mineral salts form 3 to 6 per cent. of the adult's body, and about one per cent. of that of the fœtus. Alkaline chlorides and phosphates, earthy Phosphates, with some Carbonates and Sulphates form the chief of these salts of which *Sodic chloride* is the most important, its presence exciting assimilative changes and assisting in the secretions of many of the juices, particularly the gastric; and so necessary is it to the organism that when it is supplied in insufficient quantities it is retained by the tissues and not excreted. When deprived of it, animals lose weight, spirits and activity. The *Potash salts* are also indispensable, acting as exciters of the nervous system and increasing the cardiac pulsations.

"A great daily loss occurs in the salts, which of course must be restored in the diet. By the urine of a healthy man of average weight, there is a daily discharge of about 180 to 250 grains of Chloride of sodium, and 120 to 130 grains of other salts, and by the faeces about 130 to 140 of different salts. These salts are principally Phosphates of Potash and Phos-

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phates and Carbonates of lime, etc. Accordingly, the food should contain at least 250 grains of Sodic chloride and about half that amount of other salts, and especially those of Potash to make good this daily loss."

From the above it will be seen that water is the most important element in the human body. No one function can be carried on without the aid of water. It assists digestion by promoting the solution of our food, and acts as a vehicle to convey the more dense and less fluid substances from the stomach to their destination in the body, giving fluidity to the blood, holding in solution or suspension the fibrin, albumen, red globules and all the different substances which enter into the various tissues of the body, for the whole body is formed from the blood. Water forms a necessary part of our bodily structure, and acts as a lubricator of all its tissues. Water regulates the biological and chemical changes resulting from nutrition and decay, and the effete products of the bodily waste could not be removed without the aid of water. Water regulates the temperature of the body; *first*, by lessening the action of the heart and pulse; *second*, by increasing the insensible perspiration of the skin and evaporation from the lungs; *third*, by increasing the amount of urine, especially of its water, urea, uric acid, and fixed salts; *fourth*, by promoting general tissue metamorphosis.

In 24 hours the solid food eaten by an adult contains from 15 to 25 ounces of water, and to digest this properly there should be added from 60 to 70 ounces more of water, making from 75 to 95 ounces of this fluid required daily to keep our bodies properly nourished.

Now how does the system get rid of so much water

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daily? Why, by the four great emunctories of the body, viz:

Kidneys 50 ounces Skin 32 " Lungs 12 " Bowels (faeces) 5 ounces	Total, 99 ounces of water.

It will be seen by the above, that the kidneys are the greatest excretory organs in the body, skin second, lungs third and the bowels the least.

Kidneys.—The great work of the kidneys is the excretion of water, with the waste products of the system, chiefly nitrogenous substances (urea) and the various salts. This shows us why water is so useful in the treatment of tuberculosis. It not only builds up three quarters of the human body but *washes out* nearly all of the waste products of the system. The amount of urine secreted daily, by the glomeruli and the epithelial cells covering them, depends upon the blood pressure in the renal artery and tubules; and up to a certain extent, drinking water copiously, greatly raises the blood pressure, thereby increasing the secretion of water and the urinary constituents therein dissolved; and in this way, injurious waste products and effete matter of the system are removed. In phthisis, and fevers generally, the renal vessels are less full and consequently there is a diminished quantity of urine excreted. Now drinking large quantities of water increases the velocity of the circulation in the renal glomeruli and filtration rapidly takes place from the blood into the malpighian capsules, and as the waste products and diffusible salts flow along the tubules from the glomeruli, the water *extracts or washes out* these substances from the secretory epithelium of the convoluted tubules. Landois says:

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"Through the *glomeruli the watery part* of the urine is *chiefly excreted*, while through the *convoluted tubules the specific urinary constituents* are excreted."

CONSTITUENTS OF URINE.—Besides the filtration of water from the blood, the kidneys excrete a great proportion of the solids of the body. These waste products are carried to the kidneys by the blood from every tissue in the body. These waste products may be classified into *organic* and *inorganic* bodies.

ORGANIC.—These belong to the fatty series. First of which we have the *urea*, *uric acid*, kreatin and kreatinin, xanthin and hypoxanthin, oxalic oxaluric, lactic, and glycerophosphoric acids. Added to these we have the

Aromatic series or hippuric, benzoic, phenosulphuric indoxylsulphuric and scatolsulphuric acids, urobilin and organic bodies containing Sulphur.

INORGANIC SALTS.—*Sodium, chloride, Alkaline sulphates and phosphates of lime and magnesia*, Iron Ammonia, Silicic acid, Nitric acid, and gases of Nitrogen, Oxygen and Carbonic acid.

The most important of these constituents are *urea, sodium, chloride and the potash salts.* The urea and the Sodium chloride normally bear to each other the proportion of two to one, in febrile conditions may be altered to thirty to one. In twenty-four hours the solids of the urine average from 840 to 920 grains and in general, the solids increase with the quantity of urine excreted. Hence the value of water in phthisis.

Urea and uric acid are formed in the liver and lymph glands, and are most probably derived from the decomposition of albuminous bodies. According to Parks 97 per cent. of Nitrogen of the food (urea)

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is thus eliminated by the kidneys. Urea is always increased by a diet rich in proteids. With a pure animal (Nitrogenous) diet there is formed in 24 hours 51 to 91 grains of urea, and with a non-nitrogenous diet only 16. The formation of urea and uric acid is increased by muscular exertion, and greatly so, in the dyspnœa of phthisis. Fasting lowers the urea by 10 to 11 grains and the excessive consumption of water raises it to 50 or more grains. In phthisis more Nitrogen (urea) is eliminated than is present in the food consumed. Lessened respiratory power and disturbance of the circulation increases the formation of *urea* and uric acid and decreases the Potash salts and Sodic chloride. The proportion of Sodic chloride in normal urine, is greater than that of all other salts combined, but in high fevers, the Sulphates and Phosphates predominate. The average of Sodic chloride voided in 24 hours is 180 grains. It is increased after a meal, by the excessive use of common salt, by the drinking of water, by Potash salts and by muscular exertion. With an animal diet, the earthy basis predominates, but with a vegetable, the potash salts predominate. A fever patient excretes more Potash than Soda; the convalescent more Soda than Potash. The Potash salts are greatly diminished in phthisis, and in some cases the urine becomes albuminous. The Soda salts predominate in the fluids of the body and the Potash salts in the formed tissues.

Skin.—The amount of water given off by the skin in 24 hours is from one to five pounds, averaging about two (32 ounces). Dr. Seguin says there is about 18 grains of fluid given off from the skin and lungs every minute, 11 by the skin and 7 by the lungs. Of this large amount of water the greater

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portion passes off as insensible perspiration. The perspiration is greatly influenced by exercise, the amount of fluid drunk, temperature and the dryness of the atmosphere.

The sweat is secreted in the *coil* of the sudoriparous glands. As long as the secretion is small it passes off as insensible perspiration, but when the secretion is increased, evaporation is prevented, and drops of sweat appear on the surface of the skin.

The influence of nerves upon the secretion of sweat is very marked, and the medulla oblongata contains the *dominating sweat centre*, assisted by the vasomotor nerves, especially the *vaso-dilators*. These are excited directly by a highly venous condition of the blood, as during dyspnœa, by overheated blood streaming through the centre, or by poisons. Reflex symptoms often excite these centres.

Chemical Composition of Sweat.—Water is the chief component with a small amount of salts and Carbonic acid. Human sweat (after Picard, Schottin, etc.)

Water	98.88
Solids	1.12
Salts	0,57
Sodic Chloride	0.22 to 33
Alkaline sulphates, phosphates, and lactates and potassic chloride	0.18
Fats, fatty acids and cholesterin	0.41
Epithelium	0.17
Urea	0.08

Strongly Alkaline sweat from the presence of ammoniacal salts is occasionally met with in uræmia and gout, and very acid sweat in acute rheumatism, rickets and especially the night sweats of phthisis.

Sebaceous Glands.—The fatty secretions of these

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glands keep the skin supple. The chemical constituents of this secretion are olein, cholesterin, a small amount of albumen, insoluble earthy phosphates, and traces of alkaline chlorides. These are all perverted in phthisis.

CUTANEOUS RESPIRATION.—The skin absorbs Oxygen and exhales Carbonic acid gas. The CO_2 exhaled from the skin daily averages about 60 grains and the O absorbed is from 50 to 60 grains. The exchange of gases depends upon the vascularity of the skin, and the absorption of O depends upon the number of red corpuscles in the blood.

Lungs.—The average amount of water given off by the lungs in a healthy adult in 24 hours is 12 ounces, the expired air being constantly saturated with watery vapor. When the watery vapor in the air varies, the lungs give off different quantities of water from the body, and the watery vapor is greatly increased, when the blood is thoroughly saturated with water. During dyspnœa and rapid respiration found in phthisis, asthma and all fevers the watery vapor is greatly lessened and physically the system is crying for water to flush out the poison. Aqueous vapor is always present in the air, generally it contains about three-fourths as much as it can hold when saturated. If the air be too dry, it irritates the mucous membrane. If too moist, there is a disagreeable sensation, and if too warm, a feeling of closeness. The most agreeable atmosphere to breathe is that saturated with watery vapor to the extent of about 70 per cent. The amount of moisture in the air varies; during the day it increases with the increase of temperature, and diminishes as the temperature falls. It also varies with the direction of the wind, height above the sea level, and season of the year.

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There is more watery vapor in the south and west wind, than there is in the north and east wind; more in winter than in summer, and but little on high mountains. Muscle work also greatly increases the watery vapor exhaled from the lungs, sometimes more than doubling it. The object of respiration is to supply Oxygen from the external air necessary for the oxidation processes that are going on in the body, and to remove the Carbon dioxide (CO_2) and water formed within the body. There are two respirations, first *outer*, the exchange of gases between the external air and the blood gases in the lungs and skin. *Second*, the exchange of gases between the blood in the capillaries of the systemic circulation and the tissues of the body.

The daily income and expenditure of Oxygen and Carbonic acid gas are, Oxygen 744 grains (625 pints) taken in, and *Carbonic acid gas* 800 grains (714½ pints) given off.

In the young, before the body has its growth, the CO_2 increases and it decreases as the bodily energies decay. Weight for weight, a child gives off twice as much CO_2 as an adult, and males give off one-third more CO_2 than females. Energetic, muscular, active people use more O and excrete more CO_2 than the less active or listless people. During sleep the CO_2 given off is diminished one-quarter, due to the absence of muscular exertion, constant heat of the surrounding bed clothing, darkness and non-taking of food. It is diminished in darkness and increases in the light. Animals fatten more rapidly if kept in darkness. O is not stored up during sleep, but a slight amount is absorbed and retained beyond what occurs during a period of wakefulness. Taking of food increases the amount of CO_2 given off, the greatest amount being

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about one hour after eating. Food rich in Carbon (carbo-hydrates) cause a greater excretion of CO_2 than the albumens (nitrogenous). Regnault found that a dog gave off 79 per cent. of the O inspired after a flesh diet and 91 per cent. after a starch diet.

RESPIRATORY EXCITANTS.—The most powerful respiratory excitants as to the excretion of CO_2 are coffee, tea, sugar and rum.

NON-EXCITANTS are starch, fats and alcoholic mixtures.

RESPIRATION.—The average number of respirations per minute in the adult is from 15 to 24. The pulse beats about four times to one respiration. The respirations are greatly influenced by position of the body. In the horizontal position, Guy counted 13, while sitting 19, and while standing 22 per minute.

YEAR.	RESPIRATIONS—AVERAGE NUMBER PER MINUTE.
0 to 1	44
1 to 5	26
15 to 20	20
20 to 25	18
25 to 30	16
30 to 50	18

Muscular exertion and high temperature increases the respirations. Gorham counted in children of two to four years of age during sleep 24 and standing 32 respirations per minute. Gases in the blood, and fever greatly increase the respirations. Respiration is increased a little after mid-day and a little after eating. The will power can modify it to a certain extent for a short time.

QUANTITY OF GASES RESPIRED.—The lungs never

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give out all the air they contain, about one-half remaining after each expiration. Hutchinson tabulated it as follows, in a person that has a capacity of 230 cubic inches: Complemental air, 110, Tidal air, 20; Reserve air, 100; Residual air, 100.

RESIDUAL AIR is the volume of air that remains in the lungs after the most complete expiration. It is 1230 to 1640 c.c. (100 to 130 cubic inches.)

RESERVE OR SUPPLEMENTAL AIR is the volume of air which can be expelled from the lungs *after* a normal quiet expiration. It is from 1240 to 1800 c.c. (100 cubic inches.)

TIDAL AIR is the volume of air which is *taken in* and *given out* at each respiration. It amounts to about 1500 c.c. (100 to 130 cubic inches).

About 1-6 to 1-7 of the air in the lungs is renewed after each ordinary respiration.

VITAL CAPACITY is the term applied to the volume of air which can be forcibly expelled from the lungs after the deepest possible respiration. It averages about 230 cubic inches, varying with the height of the individual. Every inch added to the height of a man of five feet gives an increase of vital capacity of eight cubic inches. Excessive bodily weight diminishes it. It is less in woman than in man. It is greater in the erect posture. Diseases of the lung and abdomen diminish it. At 35 it is at its maximum, after this age it decreases.

HEIGHT.	MALE CAPACITY.	FEMALE CAPACITY.
4 feet, 8 inches.	134 cubic inches.	96 cubic inches.
4 " 9 "	142 "	104 "
4 " 10 "	150 "	112 "
4 " 11 "	158 "	120 "
5 " 0 "	166 "	128 "
5 " 1 "	174 "	136 "
5 " 2 "	182 "	144 "

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5 feet, 3 inches.	190 cubic inches.	152 cubic inches.
5 " 4 "	198 "	160 "
5 " 5 "	206 "	168 "
5 " 6 "	214 "	176 "
5 " 7 "	222 "	184 "
5 " 8 "	230 "	192 "
5 " 9 "	238 "	200 "
5 "10 "	246 "	208 "
5 "11 "	254 "	216 "
6 " 0 "	262 "	224 "

Strange as it may seem, Dr. Hutchinson's experiments show that the height of the individual, instead of the circumference of the chest, governs the lung capacity in the normal lung. This seems the more remarkable from the fact that the height does not depend so much upon the length of the body as upon the length of the lower extremities.

Good health requires that there should meet together in the lungs every 24 hours, two thousand gallons of blood and three thousand gallons of air to feed the system with O and expel the CO_2 and watery vapor from the body. How does the system take up the O and excrete the CO_2?

CHEMICAL PROCESS.—"When the air meets the blood in the venous capillaries whereby the blood is arterialized, the O diffuses itself from the air cells of the lungs in the blood plasma. The hæmoglobin of the blood corpuscles is changed at once into oxyhæmoglobin by the unition of the O, the O expelling the CO_2."

EXCRETION of CO_2.—The excretion of CO_2 is partly a chemical and partly a secretory process. The absorption of oxygen by the red corpuscles of the blood expels the CO_2 which forms a partial chemical compound with the gases of the air. The oxyhæmoglobin on its course through the capillaries of the

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systemic circulation comes into contact with the tissues poor in O, the oxyhæmoglobin is dissociated and supplied to the tissues, and the blood corpuscles freed from this O meets with the CO_2 and carries it from the tissues to the lungs, to be expelled into the air during expiration, the giving up of O from the blood to the tissues and the absorption of the CO_2 from the tissues go on side by side simultaneously, while in the lungs the reverse process occurs simultaneously of the CO_2 exhaled for every five parts, only one part comes from the corpuscles, the remaining four parts from the plasma.

Tubercle—Chemical Constituents (Simon).

	PER CENT.
Water	82.6
Insoluble Organic Compounds	12.
Substances Soluble in Alcohol	2.1
Fatty bodies Cholesterin - cerebrin	1.86
Watery Extract	0.84
Mineral Salts	0.49

Calcareous concretions are often present in these tubercular deposits.

Insoluble Salts	70.1
Soluble	29.5

The soluble salts consist chiefly of Sodium chloride mixed with Phosphate and Sulphate of soda. The soluble salts chiefly of Phosphate of lime with a little Carbonate, Silica and Oxide of iron, sometimes cholesterin and a little of the proteids.

The above shows us why water is so valuable in arresting and washing out (when formed) this tubercular deposit, for over three quarters of the component parts of tubercule is formed of water.

SPUTA.—Normally there is but little mucous secreted from the air passages, but in pulmonary diseases the mucous membrane lining the respiratory

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tract in some cases secrete an enormous amount of mucous, mixed with saliva, nasal mucous and pus. In phthisis it ranges from 80 to 150 grams. in 24 hours, in bronchitis and pneumonia it often exceeds this. The color, odor, vicidity vary in different pulmonary affections, red coming from the presence of blood, green from biliary pigment, black from particles inhaled by miners, a putrid odor in chronic bronchitis and in gangrene.

In phthisis the sputum contains tubercle corpuscles, mucous, blood, albumen, fat, yellow elastic fibers and tubercular bacilli.

In chronic cases there are but few tubercle bacilli found. Abundant bacilli are found when there is rapid softening, hectic fever and night sweats. This is absolute proof that these bacilli are nothing but scavengers and they are always on hand when their food is abundant and they can be of service to man.

Fæces.—In a healthy adult the excretion of fæcal matter averages about five ounces in 24 hours, varying with the amount and kind of food taken. A vegetable diet greatly increases the amount of fæcal matter discharged, and it is lessened by a diet of albumen and flesh. The *quantity* of *water taken has no effect* upon the *amount of water* in the *fæces*, but the energy of the peristalsis has. The more energetic the intestinal peristalsis the more watery the fæces, because sufficient time is not allowed for the absorption of water from the ingesta. The amount of the water present in the fæces averages about 75 per cent. A flesh diet causes dry fæces; a diet rich in sugar yields watery fæces.

ANALYSIS OF FÆCES—with a mixed diet (Berzelius).

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Water	75.3	Salts	1.2
Parts soluble in water	5.7	Insoluble constituents	21.0
Bile	0.9	Undigested food	7.0
Albumen	0.9	Mucous, fat, etc.	14.0
Extractives	2.7		

COLOR.—This varies with the nature of the food and with the altered bile pigments. A meat diet gives us dark brown stools, mixed diet yellowish brown, and a milk diet yellow.

THE SMELL depends principally upon the indol and skatol present, to a less degree on the sulphuretted hydrogen, Valerianic and Butyric acids and is stronger after a flesh diet than after a vegetable.

INDOL.—This is one of the products of the putrefaction of the albumen.

SKATOL.—This is a constant constituent of the fæces, formed by the putrefaction of albumen.

EXCRETIN.—This is found in very small quantities in the fæces and is principally cholesterin.

MICRO-ORGANISMS.—Micrococci and bacteria are constantly found, and the yeast plant is seldom absent.

Air is constantly swallowed with the food, the O is rapidly absorbed in the intestinal tract, and the blood vessels in the intestinal wall give off CO_2 by diffusion from the blood and this CO_2 is discharged in the fæces. Normally, the food taken should remain in the small intestines three hours, and twelve hours in the large intestines, where the water and nourishing portions are absorbed and taken into the circulation to nourish the body. In phthisis accompanied with diarrhœa, the water and nutritious elements are lost, hence the emaciation.

This shows us how the four emunctories of the system take care of and evolve so much water daily

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from the body. Any variation of this results in disease.

Fluid Food.—In all wasting diseases, especially in consumption, there is a *deficiency* or *lack of water* in the system, and without this deficiency is made up, death must be the inevitable result. To make up this deficiency the system demands daily much more water than it does in health, for the waste of the body is much greater in disease than in health. How to make up this great deficiency of water is the great problem for the physician to solve in the treatment of tuberculosis. To make up this deficiency of fluid there should be introduced from one to two gallons of water daily into the system in addition to that taken with the food. Physiology teaches us that to nourish the body properly the food eaten daily by an adult should contain from 15 to 25 ounces of water, and to digest this there should be added from 60 to 70 ounces more of fluid, making in all from 75 to 95 ounces of water daily to carry on the proper physiological functions of the body. Now, if the system demands three quarters of a gallon of water daily, to carry on its natural functions, it is not only reasonable, but good practice, to introduce more fluid into the system in a diseased condition, with fever and all the secretions more or less arrested, to flush and wash out the effete poisonous waste matter constantly accumulating in the body; and the introduction of one or two gallons more of fluid, according to the size of the person, is not any too much to cleanse, nourish and lubricate the tissues, and restore them to their natural functions.

Now, how shall so large a quantity of water be introduced into the system daily? Many patients will have no trouble at all in drinking this amount of

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fluid, but with some the task will be performed with great difficulty, and it will require all the persuasive powers of the physician and their surrounding associates to get them to perform it. I have learned that it is better that patients should not take this large amount of water pure, but to commingle it with various nutritious substances that will have a tendency to *build* up the *solids* as well as the fluids of the body, for it is as important to build up the solids, as well as the fluids of the body. The great aim of a physician in treating a case of consumption should be to build up and fatten his patient, and that is what takes place in this new method of treating phthisis. The patients *all gain* from *one half* to *two pounds* of flesh a week, according to the emaciation present.

The following list of fluids contains the most common and useful drinks to be used in the treatment of tuberculosis; many more can be added as the practitioner deems useful:

Pure water
Mineral Water
Water with tar
Water with Phosphoric acid
Water with Sugar
Water with Salt
Aerated Water (carbonated)
Grape Juice
Beer
Cider
Lemonade
Orangeade
Milk
Condensed Milk
Skimmed Milk
Buttermilk
Pulque
Wine
Wine Whey
Scraped lean beef water
Toast Water
Barley-water
Crust Coffee Water
Clam Juice
Conch Clam juice
Fluid Beef Extracts
Bovinine
Extract of Beef (Armour)
Valentine's Meat Juice
Liebig's Beef Tea
Beef Tea
Johnston's Fluid Beef
Egg Nogg
Coffee
Tea
Chocolate
Cocoa
Rice Water
Bread-jelly
Oatmeal Porridge
Oat Meal Gruel
Arrow Root
Decoction of Iceland Moss
Decoction of Carragreen Moss
Horlick's Malted Milk

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Flour and Milk
Gum water
Tamarand Whey
Milk Peptonoid
Koumiss
Kefir
Lime Juice
Pineapple Juice
Strawberry "
Raspberry "
Cherry "
Peach "
Fig "

Fruit Syrups

Strawberry
Raspberry
Lemon
Pineapple
Orange

Fruit Jelly Water

Red Currant Jelly
Black Currant "
Grape "
Quince "
Raspberry "
Strawberry "
Crabapple "
Pineapple "
Lemon "
Orange "
Calves' Feet "
Beef Peptonoids
Soluble Food
Lacto Preparata

Malt Extracts
Granum
Horlick's Food
Ridge's Food
Gerber's Milk Food
Neave's Food
Nestle's Food
Liebig's Food
Chicken Broth
Beef Soup
Turtle Soup
Oatmeal water
Panada
Linseed Tea
Vichy Water

WATER.—Pure water constitutes the essential physiological basis of all our drinks, and is more essential to the life of man than solid food. Without water there can be no circulation nor molecular mobility of any kind. Water forms the liquid element of all the secretions, and is the medium for dissolving the food during digestion so that the system can absorb the nutritious elements of the food and cause the effete portions to pass out of the body. True aliment is a mixture of food-stuffs with water commingled with the Oxygen and Nitrogen of the air.

WATER GENERALLY.—The purer the water, the better it is suited for our use. For drinking purposes, it should be bright and clear, devoid of taste and smell. It is always more or less impregnated with a certain amount of gaseous and solid matter. When the gaseous matter consists of air and Carbonic acid it gives the water an agreeable briskness and a much better taste, and is a desirable

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accompaniment. The less there is of solid matter, the better the water is for drinking purposes.

RAIN WATER.—This constitutes the aqueous vapor which has existed in the atmosphere and becoming condensed has descended in a liquid form, and may be considered our purest water. It is found to be highly aerated, contains traces of Ammonia, Nitric acid, etc., with a little organic matter. It is particularly eligible for drinking purposes and domestic use, on account of its freedom from earthy salts. Great care should be taken in collecting it in its purity.

DISTILLED WATER.—This water, when properly aerated with Carbonic acid and air, is one of the best for drinking purposes. From the absence of air after distillation, it has too flat a taste.

SPRING WATER.—This is rain water which has percolated through the earth, and made its escape through some opening at a lower point admitting its flow. It is charged with saline and gaseous matter, according to the composition of the soil it has permeated. Many of these springs furnish us with the best kind of drinking water. Surface water from superficial wells, is liable to be contaminated with organic impurities, that often give rise to serious consequences. All such wells should be avoided. Carbonic acid, in some proportion, is found in almost all spring water, and if these waters could be thoroughly charged with Carbonic acid gas and Sulphuretted hydrogen when drunk, their curative properties would be greatly enhanced. We would then get the same effect as produced by injections of this gas per rectum. (Dr. L. Bergeon's method.)

RIVER WATER.—This consists partly of rain water and partly of spring water. Some rivers furnish us with good drinking water, but they are the excep-

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tion. As a rule, river water should not be drunk; the refuse of towns and cities being allowed to commingle with these waters, they become disease carriers and should be avoided.

MINERAL WATERS.—These are simply complicated medicines, containing various salts and gases blended together, these being derived from the soil and rocks through which they have percolated. Some of these waters, especially the Sulphur waters, earthy mineral waters, Carbonic acid waters and Chalybeate waters have been very useful in chronic pulmonary diseases. Their best effects are produced when drunk at their source. But this is often impossible, the patient not being able to go to them, in this case, the waters must be brought to them.

PURIFICATION OF WATER.—Water from shallow wells and river water should always be regarded with suspicion and subjected to a preparatory purification before being used as drinking water. Filtration through sand and gravel that is well covered with animal charcoal, will remove the organic matter and noxious excreta that are so dangerous to life, and render such water excellent for drinking purposes. But when such water is greatly contaminated with the noxious excreta from typhoid fever and cholera patients, or sewage, the water ahould be discarded, or if it has to be used, it should be thoroughly boiled instead of relying solely on filtration. Boiled water is absolutely sterilized and freed from all noxious poisons. Water containing an excess of lime can be purified by Prof. Clark's method of adding caustic lime, which will cause the foreign element to fall to the bottom in an insoluble state, or a solution of Iron, or Alum, one part to twenty thousand clarifies the muddiest water.

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MILK.—This is the most useful drink given to man, for it not only contains water, but all the chemical elements that go to make up his body, and life can be sustained with it alone for a long time, but to administer it successfully for any length of time, it must be commingled with some of the carbo-hydrates, for milk alone contains too much nitrogenous matter in proportion to the carbo-hydrates to form a complete food for adults; but when taken with a small amount of bread, oatmeal, corn bread, potatoes, etc., then it becomes a perfect food for an adult. A nitrogenous diet of milk and meat alone, is unphysiological and wrong. The great tax upon the liver and kidneys with this diet will soon produce albuminuria.

From one quart to a gallon of milk should be drunk daily. In some patients milk is repulsive and disagrees; in these cases lime water, one-third to one-half can be commingled with the milk, and in this way enable the patient to drink it successfully. But better still and much more palatable, some alkaline mineral water, such as Vichy or Applinaris can be added in the same proportion. Or, to each quart of milk add forty grains or Bicarbonate of soda with a little salt and then add one quart of water. Or, Carnrick's Soluble Food and Liquid Peptonoid can be taken with the milk, especially where the glands of the bowels are involved and we have diarrhœa. The milk should be boiled in cases that have diarrhœa. Some patients will have to take it warm.

German See considers the peculiar value of milk in phthisis to depend upon the fat it contains, and he argues that when enough milk is taken to provide the requisite amount of the other elements necessary for the nutrition of the body, the fatty constituents

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are in large excess, and this he regards as its greatest recommendation. For an exclusively milk diet he estimates the necessary quantity at three litres daily (105 ounces) rather more than five imperial pints. If diarrhœa is present, goat's milk should be used on account of the lime salts it contains.

The utility of fatty substances in phthisis is undoubted, and in those cases in which we encounter an insuperable difficulty in procuring the acceptance of the digestion of cod-liver oil, we should urge our patients to consume as much butter and cream as they can digest.

MALTED MILK.—Horlick's preparation of Malted Milk contains all the elements of nutrition and as a drink is of untold value to the phthisical patient. It requires no cooking, and will dissolve readily in either hot or cold water, making a highly nutritious and pleasant drink, that can be taken and digested by the weakest stomach. From two to six quarts of this malted milk should be taken daily, combined with solid food.

PEPTONIZED MILK.—Milk, when peptonized, contains but an insignificant amount of unassimilable material. When taken hot, it is absorbed with remarkable rapidity, and the beneficial influences, so justly attributed to hot milk by the record, are experienced in a still greater degree from the ingestion of hot peptonized milk. We are able to state this from our personal experience and observation of its use. Not only for invalids and delicate people, but for students and overtaxed people. For one who is obliged to study late at night, a glass of peptonized milk taken at such times, has most beneficial and sustaining effects in every way. There is nothing better to work upon, nothing better to sustain one's energies, both

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of mind and body, under such circumstances than hot peptonized milk, as a nourishment before retiring when fatigued and overworked, it is the ideal food.

It can be prepared in one's room without much trouble, or any special conveniences. The peptonizing powder should be mixed with the cold milk and heated gradually over a flame for a few minutes until it is as warm as can be agreeably borne by the mouth, and sipped like a cup of tea or bouillon.

BUTTERMILK.—This is an elegant drink for some patients, and is of considerable nutritive value, containing albumen, finely coagulated casein salts, water and sugar, which are largely converted into lactic acid. It should be drunk fresh as it soon decomposes. Buttermilk contains less fat than skimmed milk and is a favorite beverage with many. It can be taken in large quantities the same as milk.

SKIMMED MILK.—This is the residue after the removal of the cream. Many patients that cannot take fats can use milk in this form with great benefit. It has long been the standard diet in albuminuria; from one to two gallons can be taken daily.

WHEY.—Though not very nutritious, this is an exceedingly useful fluid food in phthisis, and in many febrile diseases, when milk cannot be digested. It is a pleasant beverage and can be given freely, from two to four quarts daily, and in this way much nutritive matter can be introduced into the system. It is eliminated by the kidneys rapidly. Much fruit and vegetables should be taken with the whey. It contains in solution the sugar and the salts of the milk and holds also in suspension a considerable portion of casein and fat, which passes through the strainer.

To make whey, take half a pint of fresh milk, heat it about 150 degrees Fahrenheit and 1½ teaspoon-

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fuls of wine of pepsin, or one teaspoonful of Fairchild's Essence of Pepsin and stir just enough to mix. Let the mixture stand in a warm place until firm coagulation has taken place. Next beat up the curd until it is finally divided and strain. Another way is to boil a quart of milk with two teaspoonfuls of lemon juice. After coagulating, break up the curd and then strain through muslin and express all the fluid. It can also be made with white vinegar, white wine, cream of tartar, rennet or alum.

This whey can be made more nutritious by adding strong beef tea, or Valentine's Meat Juice, or the yolk of an egg previously whipped up with a little hot water.

WINE WHEY.—Put one pint of fresh milk into a vessel and let it come to a boil; then add slowly half a wineglass full of sherry wine, boil for fifteen minutes, skimming off the curd; then add two tablespoonfuls more of wine, sweeten to taste and it is ready for use.

CREAM.—This is the fat of milk, and patients that can use fats, a little of this diluted in hot water can be drunk with great benefit. Butter taken with other food should be eaten in large quantities by patients suffering from phthisis; it will prove a good substitute for cod-liver oil.

CONDENSED MILK.—Where pure fresh milk cannot be obtained, condensed milk will be found invaluable. Dilute with warm or cold water, from ten to thirty parts according to taste.

GRAPE JUICE.—Unfermented grape juice, such as used for sacramental and medicinal uses, is probably the most useful element (outside of milk) we have to commingle with water to form a beverage for a patient suffering with phthisis. A patient can live a long time on grape juice alone, for it not only contains

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water, but many of the elements that go to build up the solids of the body. When it cannot be taken in its purity, one ounce, more or less, can be added to a pint of water and taken at once. This will be found, not only palatable but very nourishing, and can be drunk longer than any substance that I am acquainted with or have used. The best preparation that I have found is that prepared by Dr. Welch of Vineland, N. J., for sacramental and medicinal uses; it is so carefully prepared, and so thoroughly clarified, that when uncorked, if kept in a cool cellar, it will not ferment for many days. That sold by Gross & Delbridge comes next to this.

GRAPE CURE.—That is, a diet composed exclusively of grapes, to which can be added for many patients with profit, currants, green gages, peaches, cherries, figs, raisins, raspberries, blackberries and strawberries. Van Swieten is said to have recommended in special cases the eating of twenty pounds of strawberries in one day, and reports a case of phthisis cured from eating strawberries; but grapes have proved the most beneficial. Grape juice is looked upon by many chemists as a sort of *vegetable milk*, the composition of which closely resembles that of human milk, and is almost identical with that of buttermilk. Patients can eat from one to ten pounds daily, selecting those that are not too acid. In some patients this will prove laxative, but differing from mineral waters, for while increasing the excretions the grapes also increase the weight and vigor of the body. Often bread and milk can be added to the grapes with benefit to the patient. Many cases of consumption have been reported cured with grapes alone, especially in the first stages.

KOUMISS.—To prepare koumiss, take three

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quarts of milk, one quart boiling water, one small teacupful of granulated sugar, and one desert spoonful of brewer's yeast, stir well, put in a jar, cover with a plate and keep in a warm room from four to six hours, until a slight singing sound is heard, a sign of commencing fermentation. Bottle and secure corks well by tying them in. Patent ale or beer bottles are good. Ready for use in six hours. Improved by age. Keep in a cool room, use with a champagne tap, take from one quart to six daily.

KEFFER, OR WINE OF MILK.—To fresh milk add two per cent. of simple syrup, a little Citric acid; after being well shaken, cork securely and keep in a warm place. Ready for use in four days. It is strongly effervescent, contains two per cent. of Alcohol and ranks with koumiss. Use same as koumiss.

FRUIT JUICES, OR SYRUPS:

Pineapple Juice
Lime "
Raspberry "
Strawberry "
Peach "
Cherry "
Blackberry "
Fig "

The juice of these various fruits when commingled with water forms an elegant drink for many patients. Use one ounce of the juice, more or less, according to the taste, to one pint of water.

FRUIT JELLIES:

Red Currant Jelly
Black Currant "
Blackberry "
Grape "
Quince "
Raspberry "
Crabapple "
Pineapple "
Pear "
Lemon "
Orange "

The various fruit jellies when commingled with water, in the proportion of one or more teaspoonfuls of the jelly to one pint of water, form one of the the most palatable and delicious drinks a patient can take, and not tire of them for a long time.

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PULQUE.—This is the sap of the Maguey, or Century Plant of Mexico. The sap, or Pulque, is as nutritious as milk, which it resembles and is to-day the food and drink of millions of the Mexican people, and is used as universally as milk is in our country. Pulque is not intoxicating and may be taken free as water, but Mescal, which is made from the same plant, is intoxicating. The chemical analysis of Pulque give us Gum Arabic, Phosphorous, Potassium, Magnesia, Lime, Chloral, Alumina, Sulphuric, Phosphoric and Saline Acids. For dyspepsia and kidney diseases, especially Bright's Disease of the Kidneys, nothing known to physicians can equal the Pulque. In phthisis the use of Pulque from one to six quarts daily will prove more useful than milk. To make it more palatable the consumer if desired, can add the juice of any fruit, orange, or lemon, that may please his palate, and in this way be able to consume it in large quantities. Its action is tonic in nature, increasing the appetite, toning up the system when fatigued, quieting nervous disorders, and making good healthy blood to nourish and support the body.

CLAM JUICE.—This fluid food is of great value to patients that are very nervous and greatly prostrated. A pint bottle of Clam juice contains the vital essence of about 1500 Clams. It can be seen at once its nutritive value as a food in debilitated constitutions, can be hardly estimated. One or two pints of this salty, mucilaginious fluid food can be taken daily, combined with some of the carbo-hydrates.

LEMONADE OR ORANGEADE.—These palatable drinks can be taken in large quantities by phthisical patients, especially in hot weather. It is better to combine with these fluids some of the carbo-hy-

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drates, as bread in some of its various forms. The white of an egg or a whole egg added to lemonade enables it to be frothed up, and makes a pleasant and nutritive drink.

GRUELS.—The commingling of farina with water or milk, forms a gruel, and oatmeal is the form of farina most used. Oatmeal gruel made with water or milk is a splendid food; a piece of butter and a little sugar and salt improves the drink. An excellent drink is made by adding a handful of oatmeal to a gallon of water.

RICE WATER.—This is a pleasant nutritive drink. It may be flavored by any vegetable juice, as that of the current, raspberry, apple, grape, mulberry, etc. Malt extract can be added with profit.

BARLEY WATER.—The same applies to this as that said of rice water; both can be drunk in large quantities.

TOAST WATER AND CRUST COFFEE.—Many patients can drink large quantities of toast water and crust coffee. The various jellies can be added to this water, which makes it a pleasant and nutritious drink. Use from one to six quarts daily.

BEER.—Of all the alcoholic drinks, beer occupies the first place as a fluid food; cider second, wine third, and alcohol fourth. Beer is not only stimulating and tonic, but contains some of the carbo-hydrates and is a true fluid, nutritious food. While the Carbonic acid exhaled is slightly diminished when Beer and wine are taken in moderate quantities, the secretion of the gastric and pancreatic juices is favored and there is a gentle excitation of the nerve centres, and at the same time an undoubted addition made in the form of salts, fats, glycerine and albuminoids. As to the *role* played by alcohol in the economy, there

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is still some difference of opinion, but the weight of evidence is in favor of the theory that it acts *slightly* as an aliment. Liebig held the opinion that "Alcohol and Alcoholic drinks are from their price most costly materials of respiration. The same effect could be produced in the body by means of saccharine and farinaceous articles of food at one-fourth or one-fifth the cost." "If much Alcohol be given without other readily oxidizable food — while furnishing a certain amount of respiratory food in itself — its effect is to consume the body-store; in other words, to produce physiological bankruptcy. Especially is this to be borne in mind when there is danger of the system sinking from exhaustion. Many a case of acute disease, especially fevers, has been sent into the grave, never dug by nature but by over stimulation." Admitting this to be painfully true, there is still a useful field for Alcohol. When the digestive organs are seriously enfeebled, dilute Alcohol is all that the patient can take or the stomach retain. Alcohol requires no digestion; by its ready diffusibility it quickly passes by osmosis from the stomach into the blood. Now, commingle with the Alcohol some of the carbo-hydrates, as rice water, toast water, oatmeal, gruel or milk, and then Alcohol occupies a place as a food that cannot be supplied by any other fluid. Beer, ale, porter are all made from malted grain, hops and other bitter substances being added as they all contain malt extracts, their nutritive value is greater than wine or any other spirits. Beer increases the appetite and favors the deposition of fat. The habitual beer consumer is known by his obesity, his flushed face, embarrassed breathing, puffy hands, yellow conjunctiva, etc. He is usually short-lived and the end is from fatty degeneration either of the heart

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or the liver. But a moderate amount of beer can be taken for a lifetime without any impairment of the functions, by the thin and emaciated; but excessively fat, fleshy people, should avoid beer as they would poison. From one to two quarts can be taken daily, and some of the carbo-hydrates had better be eaten with it.

Ale that is loaded with Carbonic acid gas is one of the best expectorants I have found in bad cases of consumption, nothing will give the patient more comfort. All wines and waters that are well charged with Carbonic acid gas will be found to do positive good to patients suffering with phthisis, while *flat* wines and liquors will prove injurious.

MALT EXTRACTS.—The extracts of malt is a most excellent fluid food in phthisis. One teaspoonful of the extract contains a larger quantity of the soluble constituents of malt than is found in a pint of the best ale. It contains as well as carbo-hydrates some soluble albumenoids and salts without alcohol. Ground malt has a great future before it, as the digestive organs are enfeebled by the advance of civilization, pre-digested starch must come more and more into use, and ground malt added to baked flour, or baked farina in any form, before the hot milk is poured on, makes a most digestible dish. This milk pudding should, when mixed, be placed on a hot plate, where its heat will be maintained, and then the diastase of the malt acts promptly upon the farina. Such a milk pudding is very fluid and can be taken in large quantities. It may be enriched by the addition of an egg. Hoff's Malt Extract is one of my favorite preparations. It can be used as a delightful and nutritious table beverage, as a pleasant strengthening tonic, as a safe and efficacious remedy in disorders

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of the throat, chest, lungs and stomach, such as catarrh, sore throat, hoarseness, cough, colds, consumption, dyspepsia, constipation, foul stomach, etc.

As a substitute for Ale, Beer, Porter and every description of alcoholic drink, all of which are more stimulating than nourishing, while the reverse is true of Hoff's Malt Extract, which can be used by the most delicate invalid with the best effect.

It is also the best known preparation for the weak and debilitated, especially nursing mothers, as it not only strengthens the entire system, but acts directly on the mammary glands, thus assisting the secretion of milk.

DIRECTIONS.—As a table drink it may be used at pleasure; as a nutrient or tonic for invalids, persons in delicate health, nursing mothers, etc., it should be taken in doses of from a wine glassful to one-third of a bottle three times a day, before or during meals. The best medicinal effects are obtained by taking the malt extract regularly for a definite period in doses as above, and the result will be that the food will be properly digested and assimilated and a healthy increase of weight observed. For obstinate coughs, bronchitis, asthmatic affections, and disorders of the chest and lungs, warm it thoroughly, and add a lump of sugar and take in the morning, at noon, and before retiring at night. On each occasion one-third of a bottle. In hot climates, or in cases where the malt extract is thought to be too heavy for delicate stomachs, it may be diluted with plain soda water (Carbonated water) to suit the taste. In the intervals between taking the malt extract, the bottle should be tightly corked and laid upon its side in a refrigerator or other cool place. The most useful and best way for a phthisical patient to take malt is to dissolve

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the malt extract in aerated water (one ounce of malt to the quart) and drink from two to four quarts of this aerated water daily. If aerated water cannot be had, use hot water, commingled with milk. Best's tonic can be used the same way.

EGGS.—The egg is the most concentrated and nutritious food we have. If we include the shell, it contains all the elements of the body. Hen's eggs are those chiefly used for human food, but those of the duck, goose, turkey and guinea-fowl are also much used. Turtle eggs ought to be valuable in phthisis. Plover's eggs are greatly esteemed for their delicacy of flavor. The eggs of all birds have the same composition and are suitable for food, but are, as a rule, too small to bother with.

The average weight of a hen's egg is two ounces, of which 105 grains are shell, 405 grains white, and 240 grains yolk. In every 100 grains, Parks calculated there would be ten grains of the shell, 22.8 of albuminates and fat, and 67.2 of water. He also estimated that an egg weighing two ounces would contain just 200 grains of solids, and Pavy says such an egg would yield 100 grains of nitrogenous substance, 82 grains of fat, and 11 grains of saline matter. The shell is composed of 91 per cent. Calcic carbonate, six per cent. Calcic phosphate, and three per cent. organic matter.

The white of an egg contains less solids than the yolk, and much less fat. It consists chiefly of albumen dissolved in water, and enclosed in a delicate membrane, it coagulates at 158° F.

The yolk contains much more fat than the white, *vitillin* is its chief albuminous constituent. It also contains olein, palmitin, cholesterin and much *lecithin*, and a yellow coloring matter, inorganic salts, ex-

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tractives, and a little grape sugar. The yolk has an excess of Phosphate and the white an excess of Chlorides.

LANDOIS ANALYSIS.	WHITE OF AN EGG.	YOLK.
Water	84.8	51.5
Albuminates	12.0	15.0
Fats, etc.	2.0	30.0
Mineral Matter	1.2	1.4
Pigment extractives	—	2.1

The *yolk* in an alimentary point of view, is of more importance than the *white*, as it contains more fat as well as a peculiar form of albumen, whereas the white is chiefly a simple solution of albumen. The white of an egg, if taken in large quantities, in some persons, will produce albuminuria, but the slightest amount of cooking will prevent this. Eggs are an easily digested food, if taken raw or slightly cooked, but hard cooked eggs are difficult of digestion. In albuminuria and the uric acid diathesis, eggs should not be used. In phthisis an egg is of great value, beaten up in milk and wine, or brandy, forming an excellent concentrated and nutritious food, and may be taken three times a day between meals. An egg beaten up in coffee or lemonade is also excellent. One pint of milk, one egg, a teaspoonful of sugar, two spoonfuls of rum, and a suspicion of nutmeg, all beaten together, taken the first thing in the morning, has been credited with curing consumption. If this is taken just before going to bed, it will often prevent night sweats. Eggs beaten up with hot water and milk, with a little wine or brandy, sweetened if desired, form an excellent drink in phthisis.

There are more than five hundred ways that eggs may be prepared as food, all of which are more

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or less useful, but a soft boiled or dropped egg, is probably the best form for the sick.

OYSTERS.—These should be classed among the fluid foods, for the chemical analysis shows them to be nearly all water. König and Krauch found the whole contents of the oyster shell to contain 89.69 per cent. water, 4.95 albuminates, 0.37 fat, and 2.62 extractive. The oyster consists of two parts, hard and soft. The hard portion is the muscle that binds the shell together; it is not easily digested and should not be given to invalids, with weak digestive organs. The soft portion is the liver, and is very bulky and easy of digestion.

Oysters in season, if eaten raw, are very easy of digestion, and form an excellent food for the phthisical. Cooking, whether by grilling, scallopping or stewing, coagulates and hardens them, which makes them more difficult to digest. At the time of spawning in the month of May, they often produce noxious symptoms and should be avoided. The larger the oyster the better the food. Ten dozen can be eaten daily. If the oyster was prepared in the fluid form, like the clam juice, it would form an excellent drink in phthisis, especially if commingled with some of the carbo-hydrates.

FLUID BEEF EXTRACTS.—In phthisis, and other febrile diseases, there is, so to speak, a *mineral inanition*, or *famine* of *saline salts* and *water*. In the administration of the various forms of *fluid beef*, we are enabled to supply the tissues with these saline matters and water, that are being constantly drained away, and in this way, the albuminous extracts of meat perform a great use in the system, not only by *building up tissue formation*, but especially by *checking tissue waste*. Water, commingled with

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saline matter is the *greatest tonic* that can be given to man.

These *proteids* or *albuminoids*, form the solid constituents of the blood, nerve, muscle, glands and organs generally of the body. They also constitute more than half the solids of the gray matter of the nerve centres, and about a fourth of the solids of the white matter of the same. They form in fact, in combination with much water, and associated with certain acids, bases and salts, the chief mass of the animal tissues. In all protoplasms, there appear to exist a vitellin, as well as myosin-like body.

Robin says that the daily losses of mineral salts in fevers are from 3 to 4 grammes of Chloride of sodium, 1 to 2 grammes of Phosphoric acid, 2.967 of Sulphuric acid, and 1.730 of Potash. Compared with an analysis of bouillon we have

Water - - - - - - - - - - -	985.600
Organic Solids left after dessication in vacuo of 20°	16.917
Soluble Salts, Chlorides, Phosphates, Sulphates of Potassium and Sodium - - - - - -	10.720
Salts slightly soluble, Phosphates of Lime and Magnesia - - - - - - - - -	0.539

Practical experience shows that albuminous and gelatinous fluids, as found in beef extracts, beef tea, soups and broths, greatly support the bodily strength and prevent exhaustion.

It is an error to give these preparations of beef in too concentrated a form, in which they often prove repugnant to the sick. They should always be commingled with considerable quantities of milk or water. This is why soups are so valuable to patients.

The albumens seem to exist in a special state of hydration, apt to be modified very rapidly and un-

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ceasingly under the influence of variations in the salts dissolved in the different fluids of the body. Beef tea, as ordinarily made in the homes of the sick, is not, scientifically speaking, a food, but a *decided stimulant*, because it *contains no albumen*. But the fluid and solid extracts prepared by Valentine, Armour, Bush, etc., are not only stimulants, but true nutrients, because they contain the *albuminous matter* of the meat, as well as the salines. Albumen is material of which, and from which tissue can, and is formed, and Valentine's Meat Juice, Armour's Extract of Beef and Bush's Bovinine, should always take precedence over the beef tea that is commonly made at the homes of the sick.

NUTRITION IS THE PHYSICAL BASIS OF ALL ANIMAL LIFE, and unless the system can be properly and adequately nourished in sickness by a highly condensed and easily assimilated food, no amount of medication will suffice to effect a cure. This concentrated liquid food is perfectly represented in Armour's solid and fluid extract of beef. The best and most useful form of liquid beef extracts in the market are, Armour's Extract of Beef, Valentine's Meat Juice, J. P. Bush's Bovinine, Darby & Gosdin's Liquified Meat, by artificial digestion, Liebig's Beef Tea, and Johnston's Fluid Beef.

BEEF TEA.—Take one teaspoonful of Armour's Beef Extract, or two of his fluid beef extract, the same with Valentine's Meat Juice, to one pint of warm water, and instantly you have a delicious beef tea, or bouillon of excellent flavor. To suit the taste, add more or less salt, or celery salt and pepper. If desired, a little port wine or sherry can be added with profit. A fresh egg dropped into hot beef tea forms an excellent and nutritious bouillon.

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LIEBIG'S BEEF TEA.—Take half a pound of raw, lean beef (chicken or other meat) and mince it finely. Put it in an earthenware vessel. Pour on it three quarters of a pint of water, add four drops of muriatic acid and one teaspoonful of salt. Stir well together, and allow it to stand for an hour. Strain through a fine sieve and rinse the residue with a quarter of a pint of water. This liquid not only contains the juice, but the albumen of the meat in an uncoagulated state, with the muscle and fibrine, which makes it much richer and more nutritive than ordinary beef tea. It can be taken cold or warm.

BEEF TEA.—Take a pound of lean beef, cut into fine pieces in a chopping bowl, put the meat in a wide mouthed bottle, cork loosely, and put it into a pot of cold water; heat gradually, then let it boil slowly for three hours, which will extract all the juice from the meat. Pour off the juice and season to suit the taste. This is an excellent nutritive stimulant. The addition of the extract of malt adds to its flavor and increases its nutritious value.

BEEF JUICE.—Take fresh steak, free from fat; broil over hot coals for one minute, so as to heat it thoroughly, cut it in many places, then press out the juice by means of a meat squeezer into a warm bowl; add a little salt and serve at once.

RAW MEAT PULP.—This is prepared by rubbing the pounded meat through a sieve, without the addition of water. This can often be assimilated when no other food can be borne.

CHICKEN BROTH.—Cut the fowl into small pieces, and crack the bones. Put it into three pints of cold water; cover closely and boil for three hours, or until the meat falls to pieces. Strain, then add a little rice, which has been soaked in warm water.

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Simmer for twenty minutes. Season and serve with crackers.

BOVININE.—This is one of the most useful concentrated preparations of meat we have, especially where there is rapid waste of tissue. It is always ready for use and contains much of the albuminous matter of the meat, making it a true food, assimilating with the greatest ease, when solids cannot be taken. When mixed with hot milk, it can be taken by the youngest infant, often to great advantage.

VALENTINE'S MEAT JUICE.—This is a precious preparation of meat juice and none in the market can surpass it, in consumption and all wasting diseases. It is the pure juice of the best beef, concentrated so that two ounces of the liquid represents four pounds of the best lean beef. Extracted from the flesh by a special process, it holds all the important soluble constituents in an unchanged condition, for it has never been cooked; the albumen along with the hæmoglobin, being preserved unaltered in the solution, makes it not only a meat stimulant, but also a valuable flesh forming food. It can be retained and digested by the most delicate stomach. This meat juice is very palatable and can be prepared in a moment, by merely the addition of warm or cold water (not hot)—one teaspoonful in from two to four ounces of water; and when to be taken as a beverage, two teaspoonfuls to one pint of water makes an excellent and very nutritious drink. Four pints of this can be taken daily. Season to suit the taste, as there is no seasoning in this meat juice. Stale bread, oatmeal, arrowroot or corn starch may be added to this drink with profit.

SOUP.—In the preparation of soups, the articles used should be chopped or broken into fine pieces,

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and the bones broken into small fragments and placed in cold water, allowed to macerate for a short time for the soluble constituents to become dissolved out. It is then heated gradually to a point which should vary according to the product required. Then a prolonged gentle boiling is required in order that the gelatine may be extracted, this being the principle which gives to good soup its property of solidifying on cooling. Bones require boiling a longer time than meat. The chief principle they yield is gelatine. The marrow of bones is the best form of fat that can be used by man, and much of it should be eaten by the phthisical. Soup introduces at once into the system a small installment of ready-digested food. By filling the vessels of the stomach it assists in the secretion of gastric juice and saves the period of trial, which, in the absence of soup, must be spent by the stomach in deriving some portion of the nutriment from solid aliment; and thus the organ of digestion itself is indirectly strengthened for its forthcoming duties.

Soup should be made from the leg or shin of beef, clod, oxtail, neck, cheek or any of the bones. With these there should always be added fresh vegetables, as potatoes, split peas, beans, onions, etc.

Take one small turnip, one carrot, one stick of celery, a sprig of parsley, and a teaspoonful of Armour's Solid Beef Extract. Cut the turnip, carrot and celery into small cubes, add 1½ to two quarts of water, simmer for 1½ to 2 hours, then add the Beef Extract, and boil together gently for 20 minutes. Chop the parsley fine, sprinkle it in the empty soup tureen, pour in the soup and serve.

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FRUIT.

Fruits.—Fruit forms an agreeable and refreshing kind of food, and when eaten in moderate quantity exerts a favorable influence as an article of diet. Its proportion of nitrogenous matter is too low, and of water too high, to allow it to possess great nutritive value. It is chiefly of service looking at the actual material afforded, for the carbo-hydrates, vegetable acids and salts it contains. All fruits contain levulose sugar, and usually some acid in varied proportions, ranging from the pineapple to the lime. They all contain alkaline salts, which are good for the blood. This influence of the alkalies is shown in a decisive manner in the effects produced on the salts of organic acid in the circulation. It has long been observed that after eating juicy fruits, cherries, strawberries, apples, etc., the urine becomes alkaline. In rheumatic and gouty people, this is a practical hint of great value. Fruits should be eaten largely by such people. Tubers and green vegetables all contain these alkalies in the form of salts of the organic acids.

The agreeable taste of fruits partly depends on the aroma and partly on the existence of a due relation between the acid, sugar, gum, pectin, etc., and likewise on the amount of water and the soluble and insoluble constituents. Luscious fruits like the peach, greengage and mulberry, which seem to melt in the mouth, contain a very large proportion of soluble

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substances. The sour taste of certain berries, as the currant, etc., arises from the presence of a considerable quantity of free acid. The growth and decay of fruit is thus described by Pavy: "During its progress it increases more or less rapidly in bulk and weight, and as it approaches maturity it loses its green color, becomes brown, yellow or red, and no longer acts on the air, like the leaves, but, on the contrary, absorbs Oxygen and gives off Carbonic acid. As this process advances, some of the proximate principles contained in the unripe fruit, particularly the vegetable acids and Tannin, in part disappears, apparently by oxidation, and thus it becomes sour and astringent. At the same time the starch undergoes transformation into sugar, and the insoluble pectose into pectin and other soluble substances of allied composition and having more of a gelatinous character. The fruit in this way arrives at a state of perfection for eating. Oxidation, however, still advances, and now the sugar and remaining acid becomes destroyed, giving rise to the loss of flavor, which occurs after the full ripened state has been attained and deterioration has set in." From this we can readily see why unripe fruit as well as overripe fruit is not wholesome and salutary. The vegetable acids and the pectin disappear in the body speedily after being eaten; while the alkaline base appears in the urine as a Carbonate; though if uric acid be present, as a urate. Preserved fruits, where cane sugar is used, cause acidity of the stomach in some people, but are invaluable to the phthisical.

A great variety of fruits, both in the fresh and dried state, are consumed as articles of food or as flavoring agents and luxuries. The following are the principal varieties used.

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1. The apple, pear and quince.
2. The peach, plum, apricot, cherry, olive, date.
3. The orange, lemon, lime, shaddock, pomelo.
4. The grape, gooseberry, currant, cranberry, barberry.
5. The strawberry, raspberry, blackberry, mulberry.
6. Melon, banana, pineapple, fig.

The average composition of the most important of these is, according to Bauer:

	APPLE.	PEAR.	PEACH.	GRAPE.	STRAWBERRY.	CURRANT.	ORANGE PULP ONLY.
Water	83.58	83.03	80.03	78.18	87.66	94.77	89.01
Nitrogenous matters	0.39	0.36	0.65	0.59	1.07	0.51	0.73
Free acids . . .	0.84	0.20	0.92	0.79	0.93	2.15	2.44
Sugar	7.73	8.26	4.48	24.36	6.28	6.38	4.59
Other non-nitrogenous matters	5.17	3.53	7.17	1.96	0.48	0.90	0.95
Celulose and kernel	1.98	4.30	6.06	3.60	2.32	4.57	1.79
Ash	0.31	0.31	0.69	0.53	0.81	0.72	0.49

The analysis of the ash shows these fruits to be particularly rich in Potash salts. The apple and the strawberry are also rich in Soda salts, especially the strawberry. They also contain salts of Lime, Magnesia and Iron. Their chief food value is in the water and sugar which they contain.

APPLE.—Good apples, when cooked, are easily digested and slightly laxative in nature. In the raw state they are not so easily digested but are a great luxury. Apples are made into sauce, dessert, jelly or cider.

PEAR.—The pear is a very choice and delicate fruit. When soft and ripe, are more digestible than the apple. The pear, when ripe, is better suited for being

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eaten raw than the apple, as their flesh is soft and melts in the mouth. The hard ones should be cooked before being eaten. This fruit is chiefly used for dessert, but is also stewed and made into compote and marmalade. Perry is obtained from the fermented juice.

QUINCE.—The quince never ripens sufficiently to be eaten in its raw state, except in Persia. It is stewed with sugar; when added to apple, it greatly improves its flavor. It makes an excellent marmalade. The seeds make an excellent mucilage.

PEACH.—Peaches are particularly delicate-flavored and refreshing. Owing to the small amount of sugar they contain, this fruit agrees with everyone. They are an excellent food for the phthisical, gouty and diabetic. They are eaten raw, cooked or made into marmalade.

PLUM.—This fruit, in the form of prunes, when stewed is of great value in constipation. They should be avoided in the unripe state, for they prove indigestible, irritating, and cause diarrhœa.

APRICOT.—A good ripe apricot is an excellent fruit. If it is not ripe, it is apt to prove laxative. In the cooked state it is not easy of digestion. Green apricots are often used for tarts; when preserved it is highly esteemed. The juice, one ounce to a quart of water, is an excellent drink in phthisis.

CHERRY.—This is a luscious fruit when ripe, but should be eaten in moderation. It is generally eaten raw. In the preserved state, the juice or liquor, one ounce to the pint of water, is an excellent drink in phthisis.

OLIVE.—Olives enter into the constitution of various dishes. They are sometimes used to stimulate the appetite at the commencement of dinner, and are

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also eaten at dessert as a relish, and to cleanse the palate for the enjoyment of wine. Pickled olives are a great luxury for many. But the great use for this fruit is in the oil (the pulp of the ripe fruit contains 70 per cent. of oil) used as a food, replacing butter, not only with bread, but in cooking, especially in frying. It is very nutritious, but it is not readily digested. If given in three or four tablespoonful doses it acts as a mild laxative. It is largely used in liniments, but it is hard to get the oil pure, it is so largely adulterated with cotton-seed oil, lard and petroleum.

DATE.—This is a highly nutritious fruit and forms an important food for the Arabs. It is used both fresh and dried. Cakes of dates, pounded and kneaded together into a solid mass constitute the store of food called the "bread of the desert," provided for the African caravans on their journey through the Sahara. The fruit is of a drupaceous nature, and the fleshy part contains, according to the analysis of Reinsch, 58 per cent. of sugar, associated with pectin, gum, etc. It is only used as a luxury in this country.

ORANGE.—This is one of the most useful and agreeable of fruits, exceedingly grateful and refreshing to the palate. When ripe, it is so little likely to occasion disorder as to be admissible under almost any and every condition, in sickness or health. In fevers it is very grateful for allaying thirst. The sweet orange is largely used in its fresh state, also by the cook and confectioner. The bitter principle and the oil in the rind is used for its aromatic bitterness as a stomachic and tonic and as a flavoring agent. The orange pulp or juice contains sugar and citric acid, and makes one of the most pleasant drinks the phthisical patient can use. It may be taken in

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quantities from one to four quarts daily. Excellent wine is made from the orange.

LEMON.—The pulp of this fruit is very acid, and is extensively used to give flavor to many articles of food. The juice possesses valuable anti-scorbutic properties, and made into lemonade, constitutes one of the most popular of refreshing beverages. From one to four quarts can be taken daily, if the patient is not using milk. The rind contains a volatile oil, and bitter principle, which renders it useful as an aromatic and stomachic. In chronic malarial fever, a strong decoction of the lemon, rind and all, is of great value, curing many cases. It is occasionally made into wine, the same as the orange.

LIME.—This is an extremely acid fruit, and is largely used for its anti-scorbutic properties. One ounce more or less to the quart of water is a refreshing and useful beverage in phthisis. Two quarts can be taken daily.

SHADDOCK.—This is a moderately acid fruit, and will keep longer on sea voyages than any other of the citrus fruits. One ounce of the juice to a quart of water makes an excellent drink in the last stages of phthisis, where the patient is troubled with aphthous sore mouth.

POMELO.—This fruit closely resembles the shaddock. Its flavor is pleasant and approaches that of the orange. One ounce more or less to the quart of water makes an excellent and refreshing beverage in phthisis.

GRAPE.—See grape juice and grape cure, page 96.

GOOSEBERRY, CURRANT, CRANBERRY, BARBERRY.—These are remarkable for the free acid and sugar they contain, which make them very refreshing, and their juices form an agreeable and refreshing bever-

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age, taken one ounce, more or less, to the quart of water. The jellies made out of these fruits, dissolved in the proportion of one ounce, more or less, to the quart of water, form one of my favorite drinks in phthisis. The berries are also made into wine and preserves.

STRAWBERRY, RASPBERRY, BLACKBERRY, MULBERRY.—These are exceedingly popular fruits, and are very wholesome when eaten in moderation. They are remarkable for the amount of water, sugar and free acid they contain. They are largely used for tarts and puddings. An excellent jelly is made from them, that is of great value in forming a drink for the phthisical. The juice or syrup of these fruits should be used one ounce, more or less, to the quart of water. In phthisis accompanied by diarrhœa, use the blackberry juice or syrup, one ounce to the quart of water. The wine of this berry is also useful in these cases.

MELON.—This is the most watery of all the fruits, containing more than 95 per cent. When perfectly ripe, it forms a rich and delicious fruit, and can be eaten freely by most people, especially as a dessert. But in some people it will cause indigestion, probably from the amount of sugar it contains.

BANANA.—This fruit is highly nutritious, from the sugar and nitrogenous matter it contains. The *plantain*, the best variety of the banana, is supposed to be the fruit that Eve was tempted with in Paradise. Both varieties constitute exceedingly productive plants, and it is asserted that an extent of ground which would only grow wheat enough for the support of two persons, would maintain fifty, if cultivated with the plantain. In tropical regions, bananas are the chief support of the people. The starch is

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converted during maturation, first into a mucilaginous substance, and then into sugar. Plantain meal is prepared by powdering and sifting the dried core whilst in the green or unripe state. It has a fragrant odor, and a bland taste, like common wheat flour. It is easy of digestion, and is extensively employed in British Guiana as the food of infants, children and invalids. It is of higher alimentary value than the starchy preparations of sago, arrow-root, etc. The pulp is composed, according to Corenwinder, of—

Nitrogenous matter	4.820
Sugar, pectose, organic acid, with traces of starch	19.657
Fatty matter	0.632
Cellulose	0.200
Saline matter	0.791
Water	73.000
	100.000

This fruit I allow, and urge a person suffering with phthisis to eat freely, taking daily from one to two pounds of the bananas. It builds up his wasting adipose tissue faster than any food he can command, especially if he will combine with it a large amount of liquid food.

PINEAPPLE.—This fruit may be looked upon as furnishing the finest dessert we have. Besides being eaten in the fresh state, it is made into a preserve with sugar. The juice and syrup, one ounce to the quart, form one of the best drinks a phthisical patient can take. It not only builds up the body, but acts as an expectorant, greatly relieving the cough. Use from one to four quarts daily.

FIGS.—The fig forms a good food from the amount of sugar it contains. Where constipation prevails, figs eaten freely will regulate the bowels. In some

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patients they will produce indigestion, and act on the bowels as a laxative. There are many other fruits not mentioned here that the physician can command whenever and wherever they can be found.

How to Administer these Liquids—Their Technique.—After selecting the fluids to be used through the day, so that the patient will know just how much he has drunk, prepare in two one-quart glass fruit jars, each full, one of grape juice and the other of milk; or one jar can contain fluid beef, and the other oatmeal water; or one currant jelly water, and the other pulque; or one malt and the other pineapple juice; or one blackberry juice and the other Bovinine; or one peach juice and the other Carnrick's Soluble Food; or one Valentine's Meat Juice and the other rice water. And so on with the long list of liquid foods mentioned in this volume, trying, wherever practicable, to alternate a carbo-hydrate with an albuminoid.

Solid Food In Phthisis.—When a child or an adult shows signs of defective nutrition, and he has a delicate constitution, especially if one or both of his parents have died of phthisis, and this disease is hereditary, a sound and rational diet, both in infancy and adult life, acts as a most efficient prophylactic against the development of this fatal malady. We must strive to so *improve nutrition* that the body may gain in weight; for it is a well established fact, that when we can improve nutrition, the disease itself becomes favorably influenced thereby. *Nutrition* gives the system *force power* to resist the forces that cause phthisis, but *mal-nutrition* gives the forces that cause phthisis power to destroy the body. Then a person *predisposed to phthisis should be placed, if possible, under influences calculated to in-*

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vigorate the constitution, and to extinguish such morbid tendency. A person with a constitution where phthisis is inherited must avoid all evil surroundings, and any habits of life that would tend in the least to weaken his body, such as bad air, ill-ventilated, dusty, damp rooms, loss of rest, over sexual indulgence, self pollution, intemperance of all kinds; bad food, such as living exclusively on rye bread and potatoes; going poorly clad, and exposure in damp, cold atmosphere, and over-exertion. He should strive to live in a *pure atmosphere, at all times*, and *in all places*, with an abundance of regular, outdoor exercise; cultivate cheerfulness at all times, and eat a well selected, mixed diet of both *vegetable and animal food.* The vegetables supply the Phosphate of soda, and especially the Potash salts, nature's true solvent of uric acid and the urates; as well as the starches and sugar, carbo-hydrate or fuel foods, supplying animal heat, and building up the tissues of the body. The potential energy of the fats, however, is much greater than that of the carbo-hydrates. *Nitrogenous food*, as found in an animal diet, is absolutely essential for the construction and maintenance of the tissues. Hard work is best performed with an abundant supply of nitrogenous food.

Fruits possess precious qualities as a food for the phthisical, and should occupy a prominent place in the diet of one suffering with consumption. Their juices, distilled in nature's laboratory, need no boiling or filtering, and never convey the germs of disease. How easily they go through the tissues of the body, leaving their precious salts of Potash, Soda, Phosphorus, etc. Their acids, how refreshing; their salts, how stimulating; their delicious flavors, how

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they play on the nervous system! They clog not, neither do they cloy, but are always a luxury.

The following list contains the leading articles of solid foods that may be eaten by the phthisical and scrofulous:

VEGETABLE FOOD.

Wheat flour (bolted)
Wheat flour (whole wheat)
Wheat flour (unbolted)
Rye bread
Buckwheat
Oat Meal
Corn Meal
Barley flour
Pease
Rice flour
Beans
Potatoes
Sweet Potatoes
Lentils
Cabbage
Beets
Carrots
Melons
Turnip
Peaches
Grapes
Cucumbers
Pears
Apple
Tapioca
Plums
Manna
Sago
Arrowroot
Mushrooms
Pearl Barley
Maccaroni
Celery
Spinach
Asparagus
Lettuce
Tomatoes
Cresses
Banana
Beets
Onions

ANIMAL FOOD.

Beef (rare)
Beef (roast)
Beef (boiled)
Mutton
Liver
Pork (bacon)
Fat
Eggs
Fowl (all kinds)
Turkey
Chicken
Duck
Milk
Cheese
Oysters
Clams
Tripe
Butter
Oil
Venison
Turtle
Geese
Soups (all kinds)
Calves' Liver

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Sheep's Kidneys	Mackerel
Lobsters	Salmon
Mussels	Haddock
Skimmed Milk	Sturgeon
Cream	Cat Fish
White Fish	Eel
Trout	Bass
Cod Fish	Perch

Phthsical patients, whose digestive functions are unimpaired, can eat any form of nourishing food, that enters into the ordinary dietary of the health. Beside the solid food, large quantities of liquid food should be taken between meals to build up and fatten the body.

What is termed by the French physician, "*Alimentation Forces*"—i. e. forced feeding—is an expedient suggested by Dr. Debove, of Paris, for introducing food in large quantities into the stomachs of phthisical patients who have lost all appetite, or even acquired a positive repugnance for food.

Debove also maintains that his method of artificial alimentation, with or without a previous washing out of the stomach, with iced water, is a most efficacious measure for arresting the vomiting of phthisical patients.

Debove discovered by accident, that in cases in which all food introduced into the stomach in the ordinary way, was rejected by vomiting, food introduced by the œsophageal tube was, strange to say, retained; and on this observation he founded his method of "*Suralimentation.*" He finds he is able to introduce by this means into the stomach an "excess" of food which is retained and digested; and he truly observes that a patient with phthisis, *requires considerably more food than a person in health,* on account of the greater bodily waste taking

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place. He has observed that the digestive power of the patient has no relation with appetite. "A patient who has no appetite, or who has a marked disgust for all food, will digest perfectly a large meal introduced by the tube, and even at the end of a certain time will recover his appetite.

"As the results of *suralimentation*, or excess of food, he has observed disappearance of night sweats, cough, and expectoration; increase of strength, rapid gain in weight, and at the same time a considerable amelioration in the physical signs.

"By the use of powdered raw meat, Debove, and Dujardin-Beaumetz in Paris, and Piper in Griefswald, have been able to apply the principle of *suralimentation* without the necessity of using the œsophageal tube.

"Dujardin-Beaumetz gives the following instructions for making this powder: Take the lean of beef and cut it up into small pieces; dry it in a water-bath; when thoroughly dried, reduce it to powder in a coffee-mill. This powder can be mixed with lentil flour and taken in the form of soup, or, better still, it may be mixed with chocolate or with grog—'*grog de la powdie de viande.*' To make the latter, you place in the bowl two tablespoonfuls of meat powder; to this you add three dessertspoonfuls of 'syrup of punch,' and enough milk to make a perfectly fluid mixture. By this means you can give from 1,500 to 6,000 grains of meat powder daily. The latter quantity would be equivalent to 24,000 grains, or three and a half pounds of raw meat. (Valentine's meat juice, two ounces, represent four pounds of the raw meat. It is all ready for use, and ten times more simple to take, as directed in this volume.) Or it may be given as recommended by Debove, simply

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mixed with milk; first adding just enough milk to make a smooth paste, and then mixing in the remainder so as to make a uniform fluid mixture that can be readily drunk. It is necessary in using these powders to see that they are genuine, and not overdried.

"Debove attempts to explain the beneficial effect of *suralimentation*, in the following manner: The tubercle bacillus develops in a certain soil, a soil which becomes less favorable to its culture when it is modified by *suralimentation* (excess of food); this, indeed, augments combustion, as is shown by the amount of urea excreted in the twenty-four hours—amounts which reach from 900 to 1,200 grains, and even more. We may also say that by this method we give our patients the power to resist their disease; as when the vine is attacked by the phylloxera, one of the best remedies is to manure well the land; by so doing we do not destroy the parasites, but we give the plant the force necessary to struggle against it." (This is a strong argument in favor of *suralimentation* of liquid food, and a death blow to the bacillus theory.)

"Since the adoption of powdered raw meat for *suralimentation* the introduction of food into the stomach by means of the œsophageal tube is reserved for those cases in which, owing to the irritability of the gastric mucous membrane, food taken in the ordinary way cannot be retained in the stomach.

"While we should do all in our power to encourage our phthisical patients to take an abundance of nourishing food (and for this purpose we should make their diet as varied and attractive as possible), we must be careful not to admit into their dietary forms of food which, although attractive to the

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patient, tend to exhaust his digestive forces without rendering him an equivalent amount of support and nourishment. We should, therefore, exclude pastry, uncooked fruits, salads, pickles, and all forms of indigestible food." (I. B. Yeo, M. D.)

It would be undesirable to fix too rigidly the daily dietary of those suffering with phthisis, but in distinctly febrile cases a much more fluid dietary will have to be followed, and some of the food should be taken at least every hour. When the patient is able to be about, and there are no active febrile symptoms, a mixed solid diet of the most nutritious food that can be procured should be taken with an ever-changing variety. The same kind of food eaten daily is bad. Try to have something different every day. A change of food is not only more satisfying, but more nutritious. In the use of bread, I cannot urge the patient too strongly to use the whole wheat flour. He greatly needs the Phosphates, and in no place can they be found equal to those in cracked wheat, and the flour from the whole berry. He should also use much of the oat-meal flour (rolled avena) and corn-meal. Butter and fat should be freely eaten. A taste for these fats should be cultivated; if the patient eats one-half a pound of butter daily, so much the better.

Dr. De Meil's Perfect Health Biscuits are designed to supply Phosphates and Carbonate of lime in a palatable form. The idea is novel and practical. The biscuits are well made, and are readily taken by delicate children.

The fattening properties of milk and cream are well known, and they should be used in large quantities,—the more the better, especially in the young. Malt mixed with milk is one of my favorite foods,

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especially if some of the farinaceous foods are added. The banana is of great value as a fat-producing food in phthisis; from one to two pounds of this food should be eaten daily, by the phthisical.

Macaroni in all its forms is highly nutritious; being chiefly gluten, it is the most valuable part of wheat. Weight for weight, it is equal to meat, and for flesh making is equal to meat.

Water.—There should be taken large quantities of water during the meal, and it should be warm or quite hot. And if some alkaline water, like Vichy, could be drunk one-half hour before a meal, it would greatly benefit those who are inclined to indigestion. The freer the supply of water to the blood, the more copious the gastric and intestinal secretions will be, and the more perfect the digestion. In febrile cases, the patient will have to almost live on water and fluid foods. Much water is needed not only to replace the loss of water from the heated body, constantly passing away by the kidneys, cutaneous and pulmonary surfaces, but also to provide a necessary solvent medium to dissolve and carry away the waste products of the increased metabolism of the tissues. Such patients should be urged to take often lemonade, pure water, or effervescing water, or some of the fluid foods. Malt with water, or beer, drunk at meals, is excellent for the phthisical. It is a great mistake to think that a large quantity of fluid interferes with digestion; on the contrary, it greatly facilitates digestion.

Dr. G. See makes his patients take 16 ounces of hot tea during each meal. As a rule, people *eat too much* and *drink too little*. A phthisical patient *cannot drink too much water*. Soups and broths should form a part of the meal as often as three times a

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week. Beef gives us the weakest broth, mutton broth is a little stronger, and chicken broth is the most nutritious of all.

Dr. I. B. Yeo says, "In order to yield the necessary ration of Nitrogen and Carbon the following quantities of the under-mentioned articles would be required; for experience has shown that the diet best suited for the body must contain one part of nitrogenous foods to four of the non-nitrogenous:

TO YIELD 183 GRAMMES NITROGEN.		TO YIELD 328 GRAMMES CARBON.	
Cheese	272	Bacon	450
Peas	520	Maize	801
Lean Meat	538	Wheat Meal	824
Wheat Flour	796	Rice	896
Eggs (18)	905	Peas	919
Maize	989	Cheese	1160
Black Bread	1430	Black Bread	1346
Rice	1868	Eggs (43)	2231
Milk	2905	Lean Meat	2620
Potatoes	4575	Potatoes	3124
Bacon	4796	Milk	4652
Cabbage	7625	Cabbage	9318
Turnips	8714	Turnips	10650
Beer	17000	Beer	13160

It would be scarcely possible for any individual to consume and digest daily 2620 grammes (*i. e.* about 90 ounces) of meat, the quantity necessary in order to yield the daily requirement of Carbon, while the waste of Nitrogen would be prodigious. On the other hand, it would require 4575 grammes, or about ten pounds, of potatoes to yield the daily requirement of Nitrogen. And milk, which is the food of nature's own selection for the infant, would be most wasteful as the sole food for the adult, as he would require 4652 grammes, or ten pints, to furnish the

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daily supply of Carbon he requires and a considerable portion of the Nitrogen would be wasted. Whereas, in a mixed diet of meat and potatoes less than 538 grammes of the former, together with less than 3114 grammes of the latter, would yield respectively the amount of Nitrogen and Carbon required. The Carbon necessary for nutrition can be provided, as we have seen, either in the form of fats or of carbo-hydrates. If in the form of fat, then, according to Voit's calculations, an average working-man would require for his daily consumption 346 grammes; if in the form of starch, 596 grammes. But it is no doubt better to obtain the Carbon that we require in our food in part from both classes of aliments—from a mixture of fat and farinaceous foods. This appears to suit the digestive capacities of man, as well as his nutritive requirements, best.

"Carbo-hydrates are not able to minister as completely as the fats do to the functions of tissue growth and repair; while, on the other hand, a large proportion of fat in the food is not, as a rule, well tolerated by the digestive organs for long at a time, unless under exceptional conditions of climate, as among the inhabitants of Arctic regions, where food possessing a relatively large capacity for heat production is especially needed. It is not uncommon, moreover, to find individual peculiarities with regard to the capacity for taking fats, some persons being incapable of digesting but very small quantities; in such cases the deficiency must be supplied by a proportionate allowance of carbo-hydrates."

Dr. I. B. Yeo says, "Scrofulous children should have an abundant supply of good milk as the basis of their diet, also sound, wholesome meal bread and

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plenty of butter. Easily absorbable *fats* are especially valuable to the scrofulous. Cod liver oil is one of the best, but many other forms of fat are extremely useful, such as butter, cream, bacon fat, dripping. Bread lightly toasted, and soaked in fluid bacon fat or dripping, is generally liked by children, and is most wholesome. Suet puddings served with treacle, sugar, or jam, are also generally popular with children, and may be the means of introducing a considerable amount of fat in the food, which would be rejected if presented in its natural form. Mutton suet, chopped fine and boiled in milk and sweetened, is another useful expedient.

"It is always necessary to pay much attention to the digestion, and to at once modify the diet if it is found to be attended with signs of dyspepsia. In scrofulous children of the fat and flabby type, it is not so important to administer fatty foods. It is better in such cases to give a diet rich in albuminates, but small in bulk. The common error is to keep such children too exclusively on farinaceous food, and to give them a very insufficient supply of animal food. In children with a very delicate digestion it is often difficult to get them to take fats or oils of any kind. In such cases inunctions with oil—Cod liver oil or Olive oil—after washing the surface with hot water and soap, is a good plan. All these cases require also an abundance of respiratory food, an abundance of active oxygen, which they should be allowed to obtain by a life in the open air, in the country or by the sea." In these children *Peptonized Cod liver oil and milk* is the best form of fat that can be given them.

Rectal Alimentation.—Numerous experiments have demonstrated the fact that food introduced into

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the rectum is assimilated, and is capable to maintain the normal temperature and weight of the body. Dr. Flint thinks that food introduced into the rectum excites secretion of the gastric and intestinal glands, and in the absence of ingesta in the stomach and small intestine, the fluids secreted by these glands pass into the large intestine in sufficient quantity to effect digestion within the latter. But it remained for Dr. Campbell to solve the problem as to the rectal feeding. He asserts that instead of the digestive principles descending to the food to digest it, the food ascends to these fluids in the small intestine, and that it is there digested and prepared for absorption by the proper organs in precisely the same manner as after buccal ingestion. A great number of well established cases are on record to establish the fact that reverse peristaltic action of the intestinal canal is of frequent occurrence. Many substances, even suppositories, and pieces of tallow candles, introduced into the rectum have been vomited up. Various kinds of nutrient foods can be used for rectal feeding; as milk, peptonized milk, malted milk, all kinds of fluid beef, as Valentine's meat juice, Armour's fluid beef, Bovinine, raw eggs, soups, gruels, and about all the fluid foods enumerated in this book.

When rectal feeding is resorted to—

1st. The rectum should be washed out once daily by a copious injection of quite hot water.

2nd. Rest in a recumbent position should be taken, on the right side, with the shoulders much lower than the pelvis, for thirty minutes after receiving the enema.

3rd. The temperature of the fluid used should be quite warm, a little above that of the body.

4th. The quantity of the various nutrients used

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should be from six to sixteen ounces at a time; and when water is used, commingled with some of the juices from fruits or liquid food, there should be used each time from one to two quarts.

5th. From two to four clysters should be used daily. If rectal feeding is intended to wholly substitute buccal ingestion, milk, and the various forms of fluid beef and eggs, should be used; but, if only supplemental to buccal ingestion, all the fluids recommended in this volume may be used, and in quantities as large as the bowel can be taught to retain at each injection.

6th. At the commencement of the use of nutrient enemata, the rectum may be intolerant of the invasion and strive to expel the aliment. When this is the case, the operator should firmly press a folded napkin over the anus for a few minutes, until the desire to empty the rectum shall have passed away. The rectum can be educated to retain a large amount of fluid.

7th. The best instrument for rectal feeding is a soft-rubber bag syringe without valves, for where valves exist they are liable to be gummed over and choke the syringe. An ordinary soft-rubber female syringe is all that can be desired, care being exercised to thoroughly cleanse it.

A. Wilford Hall, of New York, has a treatment for consumption, and all other diseases, that is well worth investigation by the physician, for it does make many good cures. His treatment consists of injecting quite hot water into the bowels, commencing with one pint of water; then waiting two days and injecting one quart; two days after, one more quart, and then once in three days, two quarts. After this, every third day, he increases the quantity slowly,

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as the bowels will bear it, until he can use a gallon at a time. He does not think it necessary for the patient to retain the water until absorption takes place, but simply to wash out the colon, or the human sewer, as he calls it; his theory being that all diseases arise from three different sources:

FIRST.—If the bowels do not move regularly the small intestines secrete a gas which is carried into the circulation and vitiates the blood, producing many constitutional diseases.

SECOND.—When the kidneys do not perform their functions, uric acid is absorbed into the system, producing rheumatic and gouty diseases.

THIRD.—All specific and contagious diseases.

For four dollars he sells the outfit to a party, compelling him under a pledge *never to reveal the secret*; and he has succeeded in obtaining the most glowing testimonials from ministers and business men all over this country.

This layman (for I understand he is not a physician) has just touched upon a scientific treatment of disease. If he would allow the water to be taken up by the absorbents of the intestinal canal, and use it daily in smaller quantities, so that the bowels would retain it, his cures would be still more wonderful. The absorption of water by the digestive organs is accomplished just as easily when received into the intestinal tract by enemata as it is when taken as a drink by the mouth. The *suralimentation* of water is destined to revolutionize the whole practice of medicine. I have just treated a chronic case of tubercular diarrhœa with copious injections of hot water, three times a day, and the third day it was cured. We can medicate these injections, and in this way come in immediate contact with the diseased

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bowel; or we can use nutritious substances with the water, and in this way nourish and build up our patients. In all cases of phthisis, in the last stages of the disease, he should not only drink large quantities of liquid food, but they should be used quite warm, injected directly into the bowels. Many lives can be greatly prolonged, and some may be cured, by these enemata, if used perseveringly, as they should be, and in as large quantities as the colon will endure.

Enemata in the last two stages of phthisis is the most useful expedient we have. When the patient has absolute loss of appetite, and food cannot be eaten, nutrient enemata, persevered in, will bring back the appetite, and revolutionize the whole case.

Gaseous Enemata.—To Dr. Le Bergeon, of France, belongs the honor of introducing gaseous enemata in the treatment of tuberculosis. It consists in the introduction into the rectum of *Carbon dioxide* mixed with *Hydrogen sulphide*, better known as *Carbonic acid* and Sulphuretted hydrogen. It is not necessary for me to describe the apparatus, as it can be purchased from so many instrument makers in this country. To administer this gas, place the patient in the recumbent posture, insert the nozzle of the gas bag well into the rectum, and then slowly inject into the bowels from one to two gallons of the gas at a time, allowing, at least, ten to fifteen minutes for each injection. These injections should be given twice a day, morning and night, before a meal or three hours after. The bowels, with their extensive secreting surface, absorb these gases with great rapidity. The portal venules are always ready to appropriate Oxygen and Carbonic acid gas, and the venous blood carries it to the lungs, where it acts

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directly upon the diseased tissues, in many cases producing marvelous curative effects. All observers agree that the early effects of the use of gaseous enemata, are diminution in cough and expectoration; cessation of night sweats; lowering of the temperature, and gain in the weight of the body.

Dr. Bergeon claims many cures in well pronounced cases of phthisis. In my own hands, I have seen fine results from this gas; and in the early stages of phthisis, when thoroughly used, it will make many cures. In the last stages, associated with tubercular diarrhœa, its use is attended with great pain and aggravation of the disease.

Carbonic acid gas can be made in the stomach, often with benefit. Take twelve drops of muriatic acid in a glass of water, immediately followed by one teaspoonful of Bicarbonate of soda in water.

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REMEDIES.

General Atonic Condition of the Body, with Emaciation and Debility.—CALC. CARB., IODIUM, SILICEA, KALI IOD., ARSENICUM, FERRUM, SULPHUR, LYCOPODIUM, PHOSPHORUS, CHINA, STANNUM, COD-LIVER OIL.

Calc. phos., Ferrum phos., Natrum sulph., Calc. sulph.

Nux v., Rhus tox., Spong., Tart em., Kali bi., Cuprum.

Adjuvants.—Fluid diet. Outdoor exercise, especially mountain climbing.

Hæmoptysis, Pulmonary Hæmorrhage.—ACONITE, IPECAC, COCAINE, HAMAMELIS, MILLEFOLIUM, PHOSPHORUS, ATROPIA, BELLADONNA, MORPHIA, CHINA, VERATRUM VIRIDE, TRILLIUM, CUPRUM PHOS.

Sulphur, Arsenicum, Lachesis, Ergot, Arnica, Elaps cor., Sanguinaria, Amyl. nit., Crotlaus, Bryonia, Nitric Acid, Pulsatilla, Sulphuric Acid, Collinsonia, Digitalis, Gallic Acid.

Kreosote, Calc. C., Plumbum, Iodine, Crocus, Erigeron, Nux V., Mercury, Tartar Em., Carbo V., Silicea, Cactus, Ustilago, Sabadilla, Apocynum C., Caulophylum, Drosera, Matico, Ledum, Phos. Acid, Ferr. Phos.

Adjuvants.—Absolute mental and bodily repose. Rest in bed, with head and shoulders elevated. Swal-

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low often small pieces of ice. Cold applications to the chest, as ice in a bladder, or a rubber bag. Place the ice within several folds of a towel before applying to the chest. Dry cupping over the chest. Sinapisms. Ether spray to the spine and chest. Spinal hot water bag to cervical and dorsal region. Inhalation of cold air passing over ice. Transfusion of blood or water when death is imminent. Subcutaneous injections of Morphia or Cocaine act quickly. Diet of milk, koumiss, soups, beef tea, chicken broth, cold tea, coffee, cocoa. Inhalation of Oxygen gas. Application of a ligature to one or more of the extremities for a short time. Injections per rectum, of carbonic acid gas mixed with Sulphuretted hydrogen, I have seen to act like magic. Drink as much as one pint of very hot water every hour.

Cough (Tusis) Dry.—ACONITE, ATROPIA, BELLADONNA, ARSENICUM, BRYONIA, CONIUM, HYOSCIAMUS, GELSEMIUM, KALI HYD., LACHESIS, MERCURY, PHOSPHORUS, RUMEX, SPONGIA, SULPHUR, RHUS TOX., MORPHIA, APOMORPHIA, PILOCARPIN, IODINE, NAPHTHALIN, TANNIN, FERR. PHOS. KALI SULPH.

Causticum, Kali carb., Nitric acid, Nux v., Opium, Cina, Santonin, Camphor, Chloral, Ether, Cubebs, Ferrum, Grindelia, Cerium ox., Petroleum, Stigmata, Cup. phos.

Ambra, Arnica, Argentum n., Bromine, Chamamilla, Coffea, Drosera, Dulcamara, Graphites, Ignatia, Sepia, Sulph. Ac., Cimicifuga, Kali Brom. Veratrum Alb., Coral, Sticta, Spigelia, Sabadilla, Caulophyllum, Phytolacca, Zinc.

Adjuvants.—To loosen and allay a dry, teasing cough, administer glycerine, or the syrup of tolu in teaspoonful doses, or mix them with as much

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brandy or whiskey. Bass's ale is excellent to loosen a cough. Inhalation of hot steam with hot fomentations about the throat. Inhalation of Chloroform or Ether, vapor of glycerine, inhalation of Carbonic acid gas, Tar in Capsules, Tar water, or the Oil of tar, mucilaginous drinks, as gum arabic water, barley water, linseed tea with lemons, slippery elm, oat-meal water, frequent drafts of a little cold water. The patient should try and resist the cough. A mucilage of Tragacanth. Decoction of Iceland moss, infusion of Marsh mallow. Liquorice jujubes. Balsam of Peru with mucilage, glycerine and whiskey āā, Carbonic acid mixed with sulphuretted hydrogen injected per rectum. Avoid damp air and crowded assemblies. Cold compress upon the throat gives great relief. Practice cold sponging of the surface of the body every morning, and be out in the open air as much as possible; wear under flannel winter and summer. Apply daily Cod liver oil to the abdomen. Charcoal crackers. Pineapple juice, two teaspoonfuls to a pint of water drunk every hour is an excellent expectorant. Expectorate upon cloths and paper and then burn them at once. Strive to keep the spittoon thoroughly disinfected.

Moist or Loose Cough.—HEPAR S., PULSATILLA, IPECAC, CALC. C., LYCOPODIUM, KALI BICH., MERC., IOD., SANGUINARIA, SILICIA, STANNUM, DIGITALINE, TARTAR EM., SULPHUR, IODIDE OF SULPHUR, CUPRUM PHOS., KALI PHOS., KALI SULPH., PETROLEUM, ARSENICUM IOD., TAR.

Ammonium c., Arseniate of Soda, Ant. Crude, Kreosotum, Senega, Veratrum Alb., Lobelia, Sabadilla, Silphium, Cubebs, Salicylic Ac.

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Aurum m., Carbo veg., Carbo an., China, Chelidonium, Kali Brom., Squill, Sambugus, Kali Mur.

Hoarse, Croupy Cough.—ACONITE, SPONGIA, HEPAR SULPH., IODINE, TARTAR EM., JABORANDI, MERC. CYN., APOMORPHIA, RHUS TOX., KALI SULPH.

Sanguinaria, Bromine, Causticum, Kali Brom., Cubebs. Naphthalin, Carbo v., Rhus v., Natrum Phos.

Asthmatic, Suffocative Cough.—ARSENICUM, FOWLER'S SOLUTION OF ARSENIC, IPECAC, KALI HYD., KALI BICH., NAPHTHALIN, STRAMONIUM, VERATRUM VIR., DIGITALINE, SALICYLIC ACID, ATROPIA, PILOCARPIN, SANGUINARIA, LACHESIS, AMMONIUM BROM., HEPAR S., SULPHUR, CHINOJODIN, KALI SULPH., CUPRUM PHOS.

Grindelia, Cuprum, Kreosote, Tartar Em., Nux V., Iodine, Lycopodium, Phosphorus, Veratrum alb., Chloral, Lobelia, Kali Brom., Lobelia, Ferrum Phos.

Causticum, Gelsemium, Hyosciamus, Morphia, Asafœtida, Camphor, Calcaria fluorica, Strychnia.

Stretch the sphincter ani and cut off papillæ and out-pockets.

Hectic Fever.—ACONITE, BELLADONNA, ARSENICUM, CALC. C., CHINA, HEPAR S., LYCOPODIUM, SILICIA, SULPHUR.

Iodine, Tartar em., Stannum, Mercury, Cod Liver Oil.

Sulphuric ac., Nitric ac., Phos. ac., Muriatic ac., Graphites, Rhus tox., Bryonia, Gelsemium, Digitalis, Ipecac, Sepia, Morphia, Pulsatilla, Quinia, Iron, Zinc, Zinc oxide.

Adjuvants.—Sponging in cold salt water, sea water, alcohol or vinegar, followed by brisk friction.

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Inhalation of Oxygen gas, or drinking water charged with Oxygen and Nitrous oxide gases. Injections of Carbonic acid gas with Sulphuretted hydrogen. Flannel under-clothing should be worn winter and summer. Take daily open air exercise, Diet of solids and liquids, Inunctions of cod liver oil, Peptonized cod liver oil and milk.

Night Sweats.—ATROPIA, CALC. C., ARSENICUM, CHINA, QUINIA, MERCURY, PILOCARPIN, LICOPODIUM, SILICIA, SULPHUR, SULPHURIC ACID, NITRIC AC., MURIATIC AC., PHOS. AC., MORPHIA, OXIDE OF ZINC, PICROTOXINE, ERGOT, CARBO AN., CARBO VEG., COD LIVER OIL, SULPHONAL.

Belladonna, Iron, Iodine, Sambucus, Psorin, Gallic acid, Salicylic ac., Aconite, Rhus tox., Tannin.

Polyporus, Sepia, Graphites Talc., Petroleum, Phosphorus, Fluoric ac., Lactic ac., Staphasagra, Stannum, Thuja.

Adjuvants.—Sponging the body with vinegar and dilute Sulphuric acid, warm Alcohol, or very hot water at bed time. Warm or cold baths, well salted. If the sweating is copious, add Cayenne pepper or Mustard to the substances enumerated. To stimulate the sweat glands, lime water baths are excellent. A tumblerful of skimmed milk, or koumiss drunk on going to bed arrest many cases. Oils rubbed into the skin at bed time. Ice bag to spine. Sponge the patient every evening with a solution of Chloral, one drachm to a tumbler of brandy and water āā. Many cases will be arrested by rubbing the skin with powdered chalk. Two fluid drachms of ergot hypodermically, injected half hour before perspiring will arrest most cases. Awaken the patient before the hour of sweating, and give him a copious

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drink of grape juice or milk. Sulphonal in eight-grain doses will arrest most cases.

Aphthæ (Thrush, Muguet, Sore Mouth).—BORAX, MERCURY, KALI CHLORATE, NITRIC AC., MURIATIC AC., SULPHURIC AC., ARGENTUM NIT.

Kali Hyd., Nux V., Hydrastus, Arsenicum, Cup. Phos., Eucalyptus, Kali Sulph.

Kreosote, Natrum m., Sanguinaria, Phytolacca, Staphasagria, Iris, Sulphur, Cantharis, Hamamelis, Rhus Glab., Iodine, Zinc.

Adjuvants.—A crystal of Chlorate of potash or Borax kept in the mouth and allowed to dissolve slowly, is the best known remedy. Locally, Nitrate of Silver is excellent. Sulphurous or Muriatic Acid spray. Apply glyceroles of Hydrastus, Eucalyptus, or Sanguinaria. Apply Bismuth or Oxide of Zinc freely to the sores. Locally, apply Carbolic Acid, Sulphate of copper, Sulphite of Soda, or Permanganate of Potash. Eat freely of vegetable acids, as lemons, oranges, apples, etc. Milk and soda water āā. Use a generous diet, especially of liquids, milk, koumiss, buttermilk, bovinine, beef tea, or Armour's Extract of Beef.

Diarrhœa (Tubercular).—ARSENICUM, MERCURY, NITRIC AC., MURIATIC AC., SULPHURIC AC., IPECAC, LEPTANDRIA, PODOPHYLLUM, ALOES, COTO BARK, COTAINE, ARGENTUM NIT., GUARANO, CALC. C., FERRUM, SULPHUR, GUACO, MORPHIA, FERRUM PHOS., KALI SULPH., TALCUM.

Nux v., Bryonia, Rhus tox., Camphor, China, Croton Tig., Phos. Ac., Rheum, Secale, Terebinth, Veratrum Alb, Cod Liver Oil.

Bismuth, Opium, Gummi, gutti, Natrum, Sulph., Petroleum, Psorin, Collinsonia.

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Adjuvants.—Food must be non-irritating and in a liquid form. Boiled milk, or milk and lime water half and half. Peptonized liquid food, rice or arrow root, Armour's beef extract, Bovinine, or Valentine's meat juice. If stomach is involved, lactopeptine; if the intestines, pancreatine or inspissated ox gall, raw, half cooked eggs, oysters, ripe fruit in moderation. When great acidity prevails, substitute soda water for lime water. Mucilaginous drinks. Absolute rest in the recumbent position. Keep the abdomen and extremities warm. The whites of ten eggs in a pint of water flavored with lemon or sugar, is a nutritious beverage of great value. Lemonade or orangeade. Chicken boiled with rice. Warm peptonized milk one pint every three hours. The griping pains may be palliated by either dry or moist heat applied to the abdomen. Mustard plasters to the abdomen. Some cases are relieved by injections of warm starch, to this may be added twenty drops of opium. Wear a wet girdle, covered with oiled silk, about the abdomen. Tepid baths. Warm linseed poultice to the abdomen. Turpentine stupes. Astringent enemata of Kino and Logwood, Tannin, or compound powder of Catechu. Keep the feet warm and dry, and the abdomen covered with flannel. Avoid cold, damp air. If possible, live in a mountainous country. Saturated solution of common salt in cider vinegar, one teaspoonful *ter die*. Most cases can be arrested with powdered Talcum in fifty-grain doses given in milk, *ter die*. Drink four quarts of blackberry juice in water daily. Enemata of one pint of hot water, three times a day, has a wonderful salutary effect. Stretch the sphincter ani and cut out the papillæ and pockets.

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Thoracic pain.—ACONITE, BRYONIA, RHUS TOX., KALI CARB., MORPHIA.

Kali Sulph., Macrotin, Belladonna, Kali Iod. Ruta g., Thuja.

Arnica, Senega, Spygelia, Cactus g., Phytolacca.

Adjuvants.—Apply heat to the chest in the form of poultices, or flannel rung out of hot water. Rubber bag filled with hot water will keep the heat longer than anything else. Sinapisms. Wet pack to the chest. Turpentine stupes. Dry cupping. Fly blister. Ether spray often arrests the pain at once. Aconite and Chloroform liniment. Apply Chloral and Camphor āā. Iodine locally. Arnica, Bryonia, Belladonna, Rhus Tox. plasters. Porous plaster. Immobilize the side by adhesive plaster. If effusion takes place, aspirate. Counter irritants.

Bed Sores.—SILESIA, SULPHUR, HEPAR S., MERCURY, ARSENICUM, IODINE, CALCARIA PHOS.

Sulphuric ac., Nitric Ac., Fluoric Ac., Muriatic Ac., Lycopodium, China, Iodoform, Kali Sulph.

Calc., C., Carbolic Ac., Salicylic Ac., Phytolacca, Kali Phos.

Adjuvants.—Lessen the amount of pressure by the use of circular cushions, filled with water, air, or down. Water bed. Dust Iodoform over the sores. Bathe the sores twice a day, and then dress them with the Glycerole of Iodoform, Carbolic Acid, Calendula, Hamamelis, or Arnica. Apply twice a day an ointment of Sub-iodide of Bismuth. Iodoform, Napthol, Acetate of Lead, or Zinc. Tar-oid. Apply sponges alternately wet with hot and cold water for a few minutes, and then apply lint saturated with Phosphoric acid.

Prevention.—Great cleanliness. Have the pa-

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tient change position often. Wash the skin with Alcohol, Proof spirit, Lime water, Camphorated spirits, or a liniment of Opium and Hamamelis, Gutta percha, or Chloroform. Alum and Camphor āā mixed with the white of eggs and applied *bis die*. Olive oil three parts, Laudanum one part, Brandy two parts, applied twice a day is excellent. Silver nitrate (20 gr. 1 dr.) painted on unbroken skin as soon as it becomes red, will prevent bed sores in most cases.

REMEDIES.

Aconite.—Dry croupy cough, or dry titillating cough, every inspiration seeming to increase it—resulting from an exposure to dry cold air. The patient is greatly disturbed in his sleep by the cough; as soon as he is fairly settled down to sleep the cough commences, and so continually repeats itself. Great restlessness with a dry cough and high fever. Cough with active hæmorrhages and great fear of death. Bad effects brought on from sudden cold changes of the atmosphere. Uncontrollable anguish, with great fear of death, is a marked characteristic of Aconite. Aggravated at night with high fever and full bounding pulse.

This remedy is especially adapted to people of sanguine temperament, and a full plethoric habit, where the primary or inflammatory stage has not passed. If there is high fever present, it suits a loose as well as a dry cough; but, as a rule, will be found to act best where there is a dry cough, and aggravated at night. "There is almost always a tingling sensation in the chest after coughing. There may be stitches in the chest and side, which are often so severe as to interfere considerably with respiration, permitting only half-inch respirations; sometimes there is an oppression of the chest without pain, which keeps one from taking a deep breath, palpitation of the heart with

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great anguish. In dry bronchial catarrh, in its most obstinate form, it is the most reliable agent we have. It is also of great value in those long fits of dry morning and evening coughs, so trying to the patient from their everyday recurrence.

"Where the left lung is most involved and the pleura is at the same time implicated, manifested by a sharp stitching pain on breathing, the cough, which would be very hard were it not suppressed on account of the pain, is almost dry, it being extremely difficult to raise anything. The little that is brought up is *tenacious*, falling in a round lump, and of a dark, cherry-red color. Give the 30th." (C. Pearson, M. D.)

Active and sudden hæmorrhages, with much congestion of the lungs, after severe exertions, a fit of passion or sudden changes in the temperature from warm to cold. The blood is expectorated with a dry teasing cough; flushed face, with great anxiety and restlessness. Asthma with great anxiety of mind and restlessness.

DOSE.—1st to the 30th.

AGGRAVATION.—In the evening, particularly at night and in a warm room.

AMELIORATION.—When still and in the open air.

Arsenicum.—Rapid and great prostration, with sinking of the vital forces, in lymphatic people. Great debility and extreme emaciation, restlessness, anguish of mind and fear of death. White, waxy, pale face, with great debility; craving for acids; great thirst; craving for cold water,

This remedy is especially adapted to lymphatic, nervous temperaments, that are constantly sad and irritable. "The organic functions of the whole sympathetic nervous system are stricken down and destroyed from the inmost recesses of vitality. The blood-making power of the gang-

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drinking often, but little at a time, since the stomach cannot assimilate it. Watery diarrhœa of a cadaverous smell, with excessive prostration. All symptoms worse at night, particularly after midnight. Burning pains, the parts burning like fire, aggravated by rest, relieved by motion. Dry cough, excited by a sensation as if fumes of sulphur were inhaled, with excessive dyspnœa. Craves warm air, is sad and irritable, cannot lie down for fear of suffocation. Obstinate nausea and vomiting. Anasarca of the whole body. Cold night sweats. Tongue dry, brown or black, constantly licking the dry, cracked lips. Gangrenous aphthaeo. Tympanitis of the abdomen.

lionic nervous system is completely annihilated by the action of Arsenicum, the poison acting directly upon the red corpuscles, diminishing their power of taking up the oxygen supplied to them in the lungs; and the carbonaceous compounds thus unconsumed deposit themselves in the form of fat. If this direct action on the corpuscles be granted, many of the phenomena of arsenical poisoning become explicable. No wonder that the blood is black and coagulable, resembling that of malignant fever and cholera. Petechial effusions frequently occur, with profound cachexia."

Dr. Hirschel says, "Arsenic applies in all kinds of coughs, predominantly, however, in the *dry cough*. In acute and chronic affections of a torpid or dangerous nature; especially indicated for cough in organic diseases of an incurable or destructive nature, either in the larynx, bronchi, lungs, pleura, or heart. Its choice depends upon others than cough symptoms. These functional symptoms are: dyspnœa, asthma, suffocating spells, cyanosis, heart symptoms of all kinds, disturbed circulation, decomposition of the blood, exudations, decay and gangrene of organic substance, disorganizations, excessive pains. Constitutional indications are: exhaustion of life-power, col-

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lapse, high degree of weakness, syncope, anæmia, nervous irritability, disposition to ulceration, hydræmia, etc., nightly aggravations, worse from lying down, drinking, and change of weather."

Arsenicum is, after Aconite, one of the most important medicines in *dry catarrh* not of recent date. It operates its most striking effects in the form of dyspnœa, which results from a more or less extensive emphysema and consecutive pulmonary congestion. Thus the difficulty of breathing, which is relieved by Arsenic, does not entirely cease in the intervals of coughing, and also returns in periodical severe paroxysms, especially during the night. None the less remarkable is its action when the obstruction in the pulmonary circulation is caused by regurgitation of the blood from the ventricles into the auricles. There may be œdema of the lungs, but the secretion is scanty, and a sensation of dryness in the respiratory lining prevails. The patients complain of an exasperating titillation in the windpipe or under the sternum, chiefly in the night, that provokes a dry, wheezing, often very violent cough; this is attended, after a time, by a white, frothy, sometimes sticky, mucus. Its action is prompt and intense. Numberless invalids, who without its aid would have passed agonizing nights, are, by its use, enabled to rest tranquilly. This vitalizing action of the mineral on the nervous system has often been the means of saving the lives of children arrived at the last stage of suffocative catarrh. No remedy will be found more powerful or more sure to raise the vitality when asphyxia is too far advanced for the exhibition of Tart. em., and the tumultuous agitation of the heart foretells its fast approaching paralysis.

"Though rarely of much service in simple catarrh

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it is invaluable in the treatment of bronchitis connected with deficient assimilation and arrested organic metamorphosis. As a hæmatic and ganglionic neurotic, it displays remarkable regulating effects on nutrition in great emaciation or tendency to fatty deposits; in anæmia, malaria, cachexia and fatty degeneration of the kidneys. No less valuable is this mineral in all forms of bronchitis dating from a herpetic taint."

In anæmic subjects, with dry asthmatic nightly cough, or if there is disturbed circulation from atheromatous disease of the valves of the heart, Arsenicum will be found of much value. Anguish and despondency are prominent symptoms in cases that call for the use of this drug.

DOSE.—Use from the 2nd to the 30th. The Iodide is the most useful.

AGGRAVATION.—In the night after midnight, in cold air, or getting cold; after drinking; from exertion; while lying down with the head low and from cold drinks.

AMELIORATION.—By being wrapped up warm; from warm food and drinks; in a warm room, and by a hot stove.

Argentum Nitricum.—A withered, dried-up state from constitutional disease. Patient can't think, can't talk, can't walk, very dizzy. Minutes seem hours to the patient; time seems so long to the patient about everything. In a great hurry to do things. Great distension of the stomach with gas. Fluids

This remedy has a special and specific action upon the cartilagenous system; in tuberculosis, with ulceration of the larynx and trachea, accompanied with a dry, racking cough, it will be found invaluable, especially if there be found a syphilitic taint in the system.

Dr. Meyhoffer says, "Nitrate

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seem to run straight through the intestinal canal without stopping. Ulceration of the bowels, with chronic watery diarrhœa. Increases the activity of the secretions, removing carbon and nitrogen from the organism.

of silver proves highly beneficial in all the stages of tuberculous laryngitis. (In the beginning of the disease, when the throat and larynx are much inflamed, with titillation in the latter, much hawking and spasmodic cough, with accumulation of phlegm in the throat). At a later period, when the edges of the ulcers are the seat of luxuriant granulations, the inhalations of the stronger solutions of this salt produce excellent effects, as they reduce morbid growths. In several instances, we have aborted *incipient* serious infiltration of the sub-mucous tissue in the last stages of laryngeal phthisis. They have, however, the drawback of blackening the skin or linen with which they come in contact; that can be only partly avoided by inhaling the steam or vapor through a glass tube, or by otherwise protecting the exposed parts. Sometimes, therefore, when wishing to act with more energy, without employing the caustic substance, we use insufflation into the larynx by a slightly curved glass tube, of one or two grains of the first decimal trituration of the nitrate. The frequent effect is a violent fit of coughing, but the growth is thoroughly acted upon, and the operation need not be repeated more than three or four times. Should the vegetations, be extensive, however, or in cauliflower form, or if by their situation they should cause dyspnœa, they must either be destroyed by the *porte-castique*, or removed with the laryngeal scissors. The same operation is to be peformed on the detached flaps of the mucous membrane; (difficult and painful deglutition, with extensive ulceration of the epiglottis). We

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have seen this mineral master inflammation and swelling of the posterior wall and lining of the larynx, attended by a sensation of a clog in the vocal organs, with hoarseness or loss of voice, continued vain efforts to swallow, with pain and soreness in deglutition, with hawking, considerable muco-purulent expectoration, or titillation in the larynx, with dry spasmodic cough, 3d to the 12th attenuations."

DOSE.—Use from the 3d to the 6th decimal. Locally, crude caustic.

AGGRAVATION.—At night, and early in the morning; after eating cold food, or in cold weather; during rest, and from walking.

AMELIORATION.—In open air, craves open air; eructations; cannot sleep without fresh air.

Belladonna.—Pains come and go with great celerity. Furious delirium, wild look. Face flushed, eyes red, photophobia, rage, tears, bites, and strikes, and desire to quarrel, violent congestion of blood to the head, with strong throbbing of the carotids. Throbbing headache worse from motion and noise. Extreme sensitiveness to the least jar. Great dryness of the mouth and fauces; tonsils bright red and swollen, very dry. Spasms of the throat. Constant dry cough. Hæmoptysis with a dry teasing cough. Hæmorrhages come on

This remedy has a hard, dry, teasing, spasmodic cough, and it is generally accompanied with inflammation of the throat, and difficult, painful deglutition. "Dr. Hirschel," says Bell, "has great sensitiveness in contradistinction to the irritable Aconite. Vasomotory stimulation with increased nervosity; the chief remedy, therefore, for sensitive persons, woman and children, for erethic inflammatory forms, not for croupy, plastic ones; for spasmodic states, *cough, dry*, barking spasmodic, in paroxysms, with titillation in the trachea and bronchis, aggra-

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suddenly. All symptoms are worse evenings and at night, relieved by anything cold. Disposition to perspire, with high fever.

vations at night, with continuous sensation of having swallowed dust. Amelioration from anything cold, sensation of constriction in the throat, difficulty of swallowing; congestion to the head; stitches in the chest. In simple inflammatory catarrh of the larnyx, trachea down to the lungs, especially the first stages; more in capillary bronchitis than in pneumonia; in the beginning of whooping cough; influenza; in affections of the brain, spinal cord or heart; inflammation of parts adjacent to the respiratory organs. In stenosis of the glottis, in bronchial asthma, as an intercurrent. The parts show a pinkish, smooth redness in the larnyx, uvula, and fauces." Dr. Baehr says: "A disposition to perspire while the skin is very hot, with a dry, continual, distressing, spasmodic cough; short paroxysms of cough, but very violent, especially towards evening; no expectoration, or else a yellowish, tenacious, blood-streaked, scanty expectoration. Sensation of great fullness in the lungs without pain." Larnyx exceedingly painful with constriction of the trachea, hoarseness, paralytic aphonia of a cerebo-spinal origin, that has come on very suddenly; the paroxysms of dry cough come on, with fits of short, difficult, irregular and suffocative respiration, anxiety and great irritability, greatly aggravated at night. The active principle of Belladonna, *Atropine*, given in the 2d and 3d decimal trituration, is the most precious remedy we have in the same kind of cough calling for Belladonna, with the *neurotic elements* predominating. The parts are in a more nervous, irritable state, instead of the congestion calling for Belladonna.

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DOSE.—First to the sixth.

AGGRAVATION.—At night, by moving, or touching the parts.

AMELIORATION.—During rest and in a warm room.

Baptisia.—Secretions fœted, with foul breath. Chill every morning at 10 A. M. and 3 P. M. High fever and temperature. Great sinking sensation in the stomach with faint feeling. The parts rested upon feel sore and bruised. Can swallow nothing but liquids. Exceedingly weak.

This remedy is more particularly indicated in the last stages of phthisis, where the glands of the bowels are ulcerated, with diarrhœa and great fœtor of the stools and urine. Tongue coated brown, dry offensive breath, stupid, typhoid condition. Tightness of the lungs, can hardly breathe, muttering delirium; the head seems scattered, he must toss about to get the pieces together. Cough loose, muco-purulent, and very fœtid.

DOSE.—Tincture to the third dilution.

AGGRAVATION.—In close, warm room.

AMELIORATION.—In open, fresh air.

Bryonia.—All the symptoms are greatly aggravated by motion, and in hot weather. Patient cannot sit up from nausea and faintness. Lips dry and cracked; stools hard and dry as if burnt. Extremely irritable, the head aches in the forehead, with a feeling as if it would burst open. Severe stiching pains during inspiration. Dry cough, compels the patient to sit up. Respira-

Bryonia's great sphere of usefulness is found in all inflammatory affections of the respiratory organs, the lungs, and their enveloping membranes, that have advanced to the stage of effusion. Dr. Hirschel says: "Bryonia stands in close relation to the chest. It frequently follows Aconite, to remove the debris, and is therefore in a certain way more powerful

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tion oppressed, wishes to take in a long breath but cannot, from a feeling of oppression. Stitching, tearing pains, greatly aggravated by motion, and at night, relieved by rest. Brick dust expectoration.

than Aconite, which acts more on the general state and less on the local, and *vice versa* in comparison to Mercurius, the latter acting more on the state, whereas Bryonia affects the general state. It brings on *resolution* in catarrhs, resorption in inflammation, chiefly indicated in the second stage for slightly plastic but not highly graded inflammatory forms in croup. It is the chief remedy in bronchial affections; in catarrhal pneumonia only applicable where hepatization passes over into resolution, or where the pleura is at the same time affected; perhaps also in chronic pneumonia. The Bryonia cough is concussive by coming dry from the sternal region, as if the chest would burst, with scanty yellow or blood-streaked thin mucus, frequently associated with vomiting, especially after eating, with status gastricus, difficulty of breathing, pleuritic stitches, muscular pains, and soreness of the throat." Dr. W. H. Holcomb says, "Bryonia for a dry, concussive cough, producing pain both in head and chest, with characteristic stitching pains." Dr. Guernsey says: "Bryonia cough at night, in bed *compelling* one to *spring up and assume an erect posture at once*." Dr. Baehr says: "We wish to state, as an evidence of the healing powers of this drug, that we scarcely ever notice under its administration a copious secretion of the so-called sputa cocta, and the resorption of the infiltration takes place with very little, or perhaps without any expectoration, or, judging from the standpoint of pathology, taking place in its most perfect form." It is more particularly indicated in dyspnœa, than in

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genuine cases of asthma, but will relieve some few cases of asthma, where there is much stitching rheumatic pains.

DOSE.—From the first to the thirtieth dilution.

AGGRAVATION.—In the evening and at night, from motion and cold air.

AMELIORATION.—During rest; when warm in bed; in warm weather; after perspiration and in the daytime.

Calcaria Carbonica, or Phosphate.—Leuco-phlegmatic constitutions, large head and features. Pale, flabby skin, with a white, chalky look. In infants open fontanelles, with profuse perspiration of the head and chest, standing out in large bead-like drops, soaking the pillow with sweat. Great debility, in going up stairs; is all out of breath, has to sit down; running up stairs produces great vertigo. Feet feel cold continually, as if he had on cold, damp stockings. Cold, damp, eastern winds are sure to bring on a cold. Great emaciation with constant disposition to take cold; the cold goes through and through the patient. Hectic fever, with copious perspiration of the head and chest. Acid stomach, with sour vomiting. In children, swelling over

Calcaria, in its various forms, is one of the most useful agents we have in constitutional diseases, especially in consumption. It acts with great power through the vegetative nervous system upon the *lymphatics, mucous membranes, skin and osseous tissue.* It is especially useful in individuals in whom the process of formation and reformation is imperfectly performed, as in childhood during dentition, rachitis and in flabby fat constitutions. In cough based on an organic foundation, that is of a loose, rattling nature, it is one of the most useful remedies we have. many physicians give it in dry coughs, but I am persuaded that its great field of usefulness is after the cough has lasted awhile, and is passing into the moist or loose stage,

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the pit of the stomach like a saucer turned bottom upwards. Chronic watery diarrhœa; food is badly assimilated. In women, the menses are too often, too copious and last too long. Pains are aggravated by the slightest touch as from a current of air, noise, excitement. Walking produces great fatigue. Whole chest intensely painful to touch. Acts much better on the young.

then it is the remedy *par excellence*. Dr. Hirschel says: "Calcaria is our chief remedy in scrofulosis and tuberculosis, and therefore beneficial in many chronic coughs, especially in ulcerative processes of the larynx, or in other kinds of cough resting upon an organic base." Marcy and Hunt say: "Persons curable by it are of lymphatic temperament, scrofulous, or rickety; show plethora of the veins, easily take cold, are frail, poorly fed, but tend to grow fat. Its application in consumption is chiefly restricted to cases in which these features predominate. The patient is feeble in body and mind, though in some cases mentally precocious, and often regarded as a genius; he is subject to depression of spirits, weeping mood, restless and anxious; has no hope of recovery, is hypochondriacal; the hair falls off, the eyes are feeble, cannot bear gaslight, and he suffers from all possible derangements of digestion; the nervous system becomes excessively irritable, especially in females, producing hysteria, fault-finding, nervous exhaustion, especially menorrhagia; in males spermatorrhœa or exhausting emissions. It is proper in the stage of purulent expectoration, after Sulphur or Nitric acid." Dr. Meyhoffer says: "We fully agree with Baehr, who indicates emphysematous catarrh as being especially within its sphere of action; no less commendable is this mineral in bronchial dilatation and putrid expectoration."

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Dr. Holcomb says: "Calcaria frequently softens and mitigates a harsh, dry recent cough, but has quite a different indication in serious chronic and organic bronchial disease, which frequently finds its indications in the general symptoms or constitution of the patient, quite as prominently as in the specific symptoms of an individual case; and yet charteristic symptoms are not by any means wanting; the cough is almost always accompanied with a more or less profuse expectoration, early *putting on a purulent character.* Amelioration from lying on the back; aggravation from lying upon the sides, has a more marked control over the upper half of the right lung, than over any other portion of either lung." Intumescence in the lymphatic and glandular systems, dyscrasial affections of membranous structures, of all the white structures which have but little vitality or blood, and are nourished chiefly by lymph. Development is also imperfect or arrested in the tendons, cartilages, bones and serous membranes; emaciation and debility being the most marked symptoms of Calcaria. To eradicate the constitutional dyscrasia that lies at the foundation of asthma, especially in the young. The asthmatic breathing is associated with a feeling of tightness and soreness of the chest as if too full of blood and loud mucous rales, with a feeling of dust in the throat and lungs; worse mornings. Copious exhaustive night sweats that are always more abundant in the morning.

DOSE.—From the 3rd to the 1000th dilution; 3rd, 6th and 30th most useful.

AGGRAVATION.—From cold, damp east winds; from getting wet; when ascending heights; from loss of fluids, and from light in general.

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AMELIORATION.—In dry, warm weather; after eating.

China.—The system has been debilitated by the loss of vital fluids, as blood, semen, diarrhœa, over-lactation, night sweats, and leucorrhœa. Great exhaustion, no strength to walk, talk or do anything. Symptoms aggravated every other day; symptoms are intermitent. The symptoms are aggravated by the slightest touch; moving or touching the parts brings on intolerable neuralgia. Long-lasting congesting headache, with singing and roaring in the ears. Enormous distention of the abdomen with gas; diarrhœa of undigested food. Exhaustive hæmorrhages. Jaundice. Longing for acids; copious exhausting night sweats.

This remedy is not what might be called a cough remedy, but for peculiar states of the system it becomes a remedy of great value; for instance, in cases where the vitality has sunk very low, with great debility, and the disease is very dilatory in character. Cough when the head is *low* (it must be *raised*); violent cough after eating, with jelly-like expectoration. Dr. Meyhoffer says: "China would be sadly missed if not at hand in chronic bronchitis with loud coarse rattles, great debility and weakness; anæmic and œdematous swelling of the lower extremities. It is often the natural successor of Arsenic." Baehr says: "China is indicated if the pulmonary affection seems to constitute the whole difficulty; but still more, if it commences with the symptoms of a severe hyperæmia of the liver, and if the patients very soon show a cachectic appearance. It is well known how often pains in the liver constitute symptoms of tuberculosis." Marcy and Hunt say: "It not only prevents destruction of nerve tissue, but, by its well known effects on the function of nutrition, contributes greatly to the reparative process. It may, therefore, be regarded as the great conservator of the

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nervous system in conditions of febrile excitement or nervous prostration. Drs. Kidd and Gedham spoke most highly of the results they had obtained from the pure tincture of China in the advanced stage of phthisis. The power of China and its active principle, the Sulphate of Quinine, in arresting the destructive metamorphosis of tissue, is only beginning to be appreciated." If the great key-note of *exhaustion* from the *loss of vital fluids*, be kept in mind, China and its alkaloid, the Sulphate of Quinia, must be one of our great mainstays in holding up the patient's strength, in the last stages of phthisis.

DOSE.—The tincture, up to the thirtieth dilution.

AGGRAVATION.—In the evening; in damp, cold weather; from touching the parts; eating and drinking, and lying with the head low.

AMELIORATION.—From warmth; during rest and afternoon.

Cocaine.—Dry, spasmodic teasing cough, with excessive sensativeness of the throat and larynx; the patient has to cough constantly, no rest night or day. Copious hæmorrhages. Spasmodic asthma.

No known remedy can equal the Hydrochlorate of Cocaine in hæmorrhages of the lungs, especially where we have great excitement and fear of death. As a remedy to control the continual dry coughing it has no equal, when the mucous membrane is in a state of extreme hyperæsthesæ. In the last stages, a spray of four per cent. solution arrests and palliates the pain and continual coughing, produced by the inflammation and ulceration of the larynx and trachea. Where asthma is associated with the disease, similar to Hay asthma, the breathing is labored, the cough is dry, or seems loose, but nothing is expectorated, Cocaine will be found of great value.

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DOSE.—First three decimal triturations.
AGGRAVATION.—Night, and in cold air.
AMELIORATION.—Warm air.

Conium.—Sad, desponding people; great vertigo, particularly when lying down and when turning over in bed, Much difficulty in voiding urine, it flows and stops again repeatedly during urination. In woman there is great tenderness of the breasts, preceding menstruation; the breasts are very painful from the least jar or when walking. Nocturnal dry, hard, spasmodic cough, greatly aggravated by lying down. Yellow skin, scrofulous people with indurated glands.

This is one of our most valuable remedies in dry, teasing, spasmodoc cough, lasting a long time after lying down at night. The Conium cough is always dry and greatly aggravated by night air. Dr. Hirschel says: "Its action takes in organic metamorphosis. Its cough is periodic, dry, caused by any itching, scraping titillation in the throat, or under the sternum; short convulsive cough, excited by horizontal position, speaking or laughing. The two latter exciting causes of the cough are decisive for the choice of the remedy. The irritation of the cough is seated in the trachea or upper bronchi. In whooping cough it suits toward the end of the nervous stage after Drosera, when speaking and laughing cause paroxysms, whose power and duration are already broken. In nervous bronchial asthma, it shows good effects and certainly brings alleviation in organic cases."

Its action on the larnygeal nerves and larnyx is strongly marked in the provings, and has often been confirmed in practice; its action on the lungs is less marked. The Conium cough is centered in the larnyx, trachea and upper bronchi. Aggravations at

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night when lying down; from deep inspirations, laughing, moving constantly.

DOSE.—First three attenuations.

AGGRAVATION.—At night, during rest and cold air.

AMELIORATION.—Warm atmosphere, and continued motion.

Cuprum Phosphoric.—Loose rattling cough with much emaciation and debility. Frequently vomits when coughing. Copious watery diarrhœa. Mucous membranes loaded with mucus from paralysis of the vagi.

This is one of my most useful remedies in the first and second stages of phthisis, where there is hectic fever, night sweats, associated with a loose cough; expectoration very copious, muco-purulent sputa. The patient has extreme weakness seeming to center in the lungs; emaciation, with great mental depression. In these cases it ranks with Hepar sulphur. The cough is often associated with vomiting and diarrhœa. In chronic bronchitis with a loose cough, the expectoration is copious and fœtid. This is a grand remedy.

Digitalis.—A very slow, intermittent pulse, never rapid, but greatly excited by the least movement. Exceedingly prostrated after coughing; cough after eating with vomiting of food. Where the heart is involved, with anasarca and general dropsy.

This remedy has a special action upon the vagi; its functions are interfered with, the bronchial mucous membranes become loaded with mucus; and we have a moist loose, rattling cough, with an abundant expectoration. Cyanotic symptoms in the face, and a sensation of an excessive determination of blood to the lungs, which produces great difficulty in breathing. Baehr says: "Digitalis is particularly adapted to galloping phthisis, with intense hectic

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fever from the commencement; the patient complains of palpitation of the heart; coughs up blood frequently; has no appetite; the cough must not be dry; bowels constipated, and the pulse exceedingly quick. Digitalis is the most reliable remedy to moderate the hectic fever, but the dose must not be too small, nor should it be exceedingly large, because large doses are apt to excite the patient." Meyhoffer says: "Digitalis is one of our most valuable medicines in passive congestion of the lungs, and chronic catarrh resulting from a weakened, dilated heart, irregularity and intermission of the pulse; scanty secretion of urine and œdematous swellings, are its characteristic symptoms."

DOSE.—I use the 2d and 3d decimal trituration of Digitaline, and the Fluid Extract in from two to five drop doses.

AGGRAVATION.—From motion, getting heated, and a warm room.

AMELIORATION.—During rest.

Ferrum.—Anæmia, with great paleness of the mucus membranes, especially that of the mouth. Muscles feeble, easily exhausted from slight exertion. The least emotion or exertion produces a red flushed face. Face, suddenly becomes fiery-red, with vertigo, ringing in the ears, palpitation of the heart with dyspnœa. Loud bellows-sound of the heart from anæmia. Œdematous swelling of the body; con-

Iron especially affects the blood plasma, decreasing the albumen and red corpuscles, increasing the water in the serum sanguinis, producing anæmia and chlorosis. Iron in the constitution of our tissues acts in the twofold character of pabulum and medicine. In the present state of science it is often impossible to determine the exact limit where the nutritive action ceases, and the medicinal be-

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stantly chilly. Diseases coincident with dropsical conditions; coldness of the body predominates, especially at night. Hæmorrhagic tendency. Stools of undigested food, without pain. In women, menses too frequent, too profuse, and last too long. Chlorosis. Better when walking slowly.

gins. Strictly speaking, Iron is not what we would call a true cough remedy, but it is so valuable in peculiar states of the system, that we class it among our most valuable remedies. Dr. Rueckert says: "Iron produces, (1) Relaxation and weakness of the entire musculature, and emaciation, weakness of digestion, coldness of the extremities. (2) Anæmia under the mask of plethora and congestion, accompanied by a whitish color of the mucous membranes. (3) Pulmonary tuberculosis, especially in young florid subjects with a remarkable erethism of the vascular system, inclination to congestion of the chest. But we will remind here of the property of Iron, in larger doses, to occasion hæmorrhages, a reason for which Allopathic physicians do not give it in tuberculosis with inclination to hæmorrhage. (4) Aphonia very distressing. (5) Chronic watery diarrhœa, especially in children, usually soon after eating and drinking; *without pain and effort*, mostly containing undigested substances. Iron is the remedy often indicated after previous abuse of Iodine, Arsenic and Quinia."

Dr. Meyhoffer says: "Iron, (Acetate, or Perchloride)—Dry cough, from vascular congestion, with difficult and oppressed breathing; diminished or rough vesicular murmur and fine sibilant ronchi; spitting of blood, or bronchial hæmorrhage, small, weak pulse; palpitation of the heart on the least muscular exertion, deficient gastric secretion; the food lies heavy in the stomach; bowels relaxed and discharg-

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ing undigested food; suppressed menstruation or profuse flooding."

The cough of Iron predominates dry, but in the morning the expectoration may be copious, of either mucous or purulent matter, with oppressed, short breathing, worse in cold air, and relieved by warm air. Dr. Pope says: "The cases in which Iron is especially valuable are those in which the patient is usually between twenty and thirty years of age; family history is free from any hereditary taint and to tubercle; he is of a sanguine temperament, of a florid complexion, with an active circulation, and an easily excited nervous system; the disease has been excited by neglected catarrh, causes which originated mal-nutrition with frequent inflammatory attacks upon the pulmonary organs; epistaxis, hæmoptysis, headache, congestion in various parts, easily excited; hectic fever runs high, and the loss of strength is very rapid; there is dyspnœa, vomiting of food, or lienteria." Dr. Cl. Müller says: "Cough, dry at night in bed; loose, and more frequent when walking; chest painful above and behind the sternum, with burning after coughing. The cough is appeased by eating. The night cough is more oppressive, and sometimes attended with spitting of blood; at other times this occurs in the morning. Tobacco and brandy cause aggravations, or increase the mucopurulent expectoration; dryness in the chest, but transiently relieved by drinking, with copious secretion of mucus. Shooting pains and a sense of tightness between the shoulders, impeding movements of the joints; the chest feels full and tight, with sanguine congestion; painful oppression which causes one to be seated, and sometimes amounts to a constrictive spasm; the respiration is noisy, as in sleep;

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the breathing slow and painful, relieved by walking, or in speaking, and when most preoccupied in reading and writing; it is most troublesome when in bed, and in the evening; *the pains are worse after eating.* I cannot better characterize the sphere of Iron in phthisis, than in affirming its indication by those very states in which Allopathists have found counter indications and danger. It is most suited for young and florid subjects, presenting a transient erethism of the circulation, with congestive tendencies toward the chest and head. The special symptoms are: agitation and heating, easily induced by corporal movements and moral emotions; and as a consequence, palpitation, dyspnœa, cough, sudden flushes of the cheeks, epistaxis, hæmoptisis, quick fatigue and nervous excitability. Iron rarely fails to help these subjects. It is also useful in hectic fever, colliquation, with weakness and emaciation—thus either at the beginning or towards the end of the disease. Much is to be hoped from Iron when the hereditary germ breaks out in the midst of florid health; and it is well known that these cases are not the least serious. The palliation effected by iron in the third stage, often suffices to banish for a time the varied phenomena of hectic fever, while the gastric forces recuperate under it.

Dose.—The 1st and 2d decimal trituration of the Pyrophosphate, or the Iron by Hydrogen. The dialyzed Iron in from two to ten drop doses, is a great favorite with me. The Chloride should be given in the first three dilutions.

Aggravation.—While at rest; from noise, and in the morning.

Amelioration.—From slow exercise, and during the day.

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Hamamelis.—Especially called for in passive hæmorrhages. The blood is dark and comes into the mouth without any effort, like a warm current out of the chest. Tickling cough with a taste of blood on waking.

In hæmoptysis, this is well nigh a specific. No remedy has given such prompt and satisfactory results in active or passive venous hæmorrhages from the pulmonary mucous membrane. Dr. Hughes thinks the hæmorrhages it cures depend rather upon the state of the blood-vessels than that of the blood. It probably cures hæmorrhages by its specific action upon the muscles of the capillary blood-vessels, causing them to contract. When the blood comes from the pulmonary mucous membrane this is well nigh a specific; but if the hæmorrhage is due to a rupture of the blood-vessels from deep ulceration, Aconite, Cocaine, Veratrum viride or Millefolium will act better.

Hepar Sulphur.—Great disposition to take cold; excessively sensitive to cold air. Sweats day and night without relief, especially about the chest; perspiration has a very sour smell. Cannot bear to be uncovered. Coughs when any part of the body is uncovered. Second stage, when suppuration is inevitable. Hoarse, dry, croupy cough; loose cough; expectorating large quantities of mucus and pus. Laryngo-tracheal catarrh with much hoarseness. Symptoms worse during north or cold west winds. Great sensitiveness to every-

This is the most useful and the most frequently indicated remedy we have in phthisis. After the first stages of cough have passed, and we commence to have a loose, hoarse, rattling cough, no remedy can equal Hepar. Dr. Hirschel says: "Hepar suits those cases which are so far advanced by Acon., Bry., Brom., Merc., Iod., or Spongia, that they have passed into the stage of resolution. It is our most important remedy where, in acute forms, this resolution has been prepared, or in moist coughs, resting on a catarrhal

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thing, cannot bear the slightest draft of air or noise.

organic base, involving the whole respiratory organs. In croup, as well as pneumonia, it can only be indicated in the second stage. It suits tuberculosis far less than cheesy and chronic pneumonia. It may also be indicated in gastric and intestinal catarrhs or complications, or in sympathetic cough, or in such ones extending from inflammations of adjacent parts of the mouth and fauces. Hoarseness, scraping irritation in the larynx, or in the parts, mucous râles, are important indications for this remedy, acting on the plasticity of these processes." Dr. Guernsey says: "Hepar has a rattling, *choking* cough; it seems as if the patient would *choke* in coughing; in croup, whooping cough, or in catarrh, worse towards morning and after eating."

Marcy and Hunt say: "Hepar is an important specific for the following characteristic symptoms: Anxious, hoarse, wheezing respiration, much aggravated on lying down; attacks of suffocation, which force the patient to throw the head back in order to take breath; dyspnœa, dry and hollow cough; hoarseness of voice; cough with expectoration of mucus; fever, worse in the after part of the day, succeeded by night sweats. In cases which seem to have been connected with suppression of salt rheum, or other eruptive diseases, or metastasis of arthritic inflammations. The patient has an unhealthy skin, which cracks or chaps, and runs into suppuration or ulceration from slight injuries; is subject to pimples and blotches; sweats from the slightest exertion, and profusely at night; mentally irritable, impatient; has vertigo, with pain in the head; falling off of the hair; erysipelatous eruptions of the face; feeling in the throat of something sticking, or

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rough scraping or stinging stitches; rawness of the fauces, swelled tonsils; expectoration mixed with blood. Putrid taste in the mouth, loathing of food; vomiting and water-brash."

Dr. Meyhoffer says: "Hepar, 2d or 3d decimal, one grain morning and evening, will not be unworthy of reliance in the chronic catarrh of scrofulous children and adults, especially when the morbid process shows a tendency to invade the pulmonary vesicles. This is the moment when careful auscultation will enable the physician to nip in the bud the further progress of catarrhal pneumonia by appropriate means, of which Hepar is one of the most efficient. This substance is not of minor importance in the bronchitis engendered by swelling of the bronchial glands. In such cases the remedy must be continued as long as the improvement progresses. In subacute catarrhal processes Hepar corresponds to the stage characterized by the incipient collection of mucus in the air tubes. As this fluid at that period is composed essentially of mucous cells, and contains but a small proportion of pus-corpuscles, it is thus rendered particularly glutinous and sticky. Hence the violent and suffocating paroxysms of coughing, often attended by retching." Dr. Nichol says: "The characteristic cough of Hepar is a dry, rough and hollow cough; or the cough may be dry and crowing, coming on in violent paroxysms. The expectoration is generally mucus, though sometimes bloody froth is raised, and occasionally small, hard, tuberculous masses. The respirations are hoarse, anxious and wheezing, and the difficulty is much aggravated by lying down. The dyspnœa is very marked, with suffocative attacks which force the patient to throw the head back in order to take breath. The voice is

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hoarse and croaking, and the fever, which exacerbates towards evening, is followed by night sweats." Dr. Baehr says: "A characteristic indication for Hepar is a dry, spasmodic, barking cough, with a wheezing sound over the whole thorax, without any mucous râles; it is a steady cough, only at intervals increasing to dreadful paroxysms, with danger of suffocation; it is excited by every attempt to draw a long breath, and only results in the expectoration of a yellowish, tenacious mucus." To eradicate the peculiar dyscrasia that lies at the foundation of asthma, where the attack comes on in the night, with constriction of the chest and suffocative breathing, with a *choking cough*, and a large collection of mucus in the bronchi: Tuberculosis or chronic Bronchitis being at the foundation of the asthma.

DOSE.—2nd to the 1000th. The 3d and 6th being most useful.

AGGRAVATION.—At night. Cold, and cold northeast winds.

AMELIORATION.—Relieved by warm air, and warmth.

Iodine.—Remarkable sense of weakness and loss of breath in going up stairs. Low, cachectic, scrofulous people with enlarged lymphatic glands, and especially the thyroid. In women, emaciation of the mammæ which hang down long and heavy; with copious menstruation, or long lasting uterine hæmorrhages. Dry cough predominates, with hoarse-

This is a grand constitutional remedy in chronic cases that are engrafted on a low, cachectic, scrofulous constitution, with much emaciation, profound debility; can hardly breathe on going up stairs; night sweats. The lymphatic glandular system is greatly enlarged, and nutrition is extremely bad. Atrophy of the mammæ and testes are

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ness. Great emaciation, debility with copious night sweats. Skin dark brown, with brown or black hair. All the symptoms are aggravated by warm air and relieved by cold.

marked symptoms. The specific action of Iodine upon the thyroid gland and upper portion of the air passages is very marked. Dr. Hirschel says: "Iodine, Bromine and Spongia have this in common; that they especially cure the affections of the upper parts of the respiratory organs; that they correspond to dry cough, if of a catarrhal, inflammatory or organic origin. All are deeply penetrating and reliable remedies. Spongia might be considered the most volatile and dynamic; Bromine is materially incisive, forcible, and helps quickly: Iodine is the strongest, but most slow in action. They are the chief remedies in the affections of the larynx and trachea (catarrhs, inflammations, especially croup, changes in texture); also in stenosis of the glottis, Iodine alone has also some relations to the bronchi, and even to the pulmonary tissue. According to the symptoms we find in Bromine dry croup cough, with scraping titillation and hoarseness; this is a special indication for Bromine, where small follicles are found on the posterior mucous membrane of the pharynx, extending to the larynx, and producing continued titillating cough, with swelling of the mucous membrane of the fauces, the larynx being painful to the touch, Bromine is specific. In Iodine the cough is also dry, croupy, with titillation and sensation of soreness in the larynx; barking, with gray or white salty, sweetish expectoration; shrill whistling and rattling in the chest; sawing, hissing respiration, with oppression. The subjective sensation of soreness and pain frequently extends to the upper third of the sternum. Hoarseness, difficult speech and ex-

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pectoration of tough mucus. I have frequently witnessed from Iodine splendid effects in long-standing laryngeal catarrhs with the above symptoms. It alleviates in tuberculosis; in croup it is our last anchor, where Spongia and Bromine fail. It is not an easy matter to select from these three remedies; each may be indicated according to circumstances. *The more plastic the exudation, the more Iodine is indicated.* Anatomically, we might say, spongia is more suitable for stases, simple inflammation; Bromine for swelling and hypertrophy of the mucous membranes; Iodine for exudation." Dr. Meyhoffer says: "The effort to give precise clinical indications for Iodine is to us a difficult one. For example, as regards the respiratory surface, we meet within the range of its salutary influence the dry, congestive catarrh, profuse bronchorrhœa and catarrhal pneumonia, with all the intermediary morbid conditions. Still one link exists which binds all these so contradictory symptoms together, and this is *irritation.* Torpidity and atony of the ventilating apparatus does not lie within its range. Iodine has, in common with Cod-liver Oil, the property of being exquisitely adapted to delicate constitutions, with quick pulse, tendency to bronchial and pulmonary congestion and hæmorrhage. For the same reason it is also an excellent remedy for over-grown lads, with weak chest and dry cough, subject to spitting of blood and cardiac palpitation. The cough is always more or less severe, be the expectoration scanty or copious; fine or coarse rattles and sibilant ronchi give way to its influence. Swelling of the cervical and bronchial glands, nocturnal sweats, great weakness and progressive emaciation, notwithstanding a good appe-

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tite and bowels, are confirmative indications for the exhibition of Iodine."

Dr. Baehr says: "Iodine is undoubtedly one of the most important remedies in confirmed phthisis; it only suits, however, after the expectoration has become purulent. This remedy effects more frequently than any other curative results, provided we do not obstinately insist upon giving only small doses. Iodine 6x sometimes has a good effect, but Iodine 1x is often indispensable; nor need any unpleasant effects be apprehended from the use of large doses. Iodine is more particularly indicated if tuberculosis is the result of scrofulosis in the case of young and robust individuals; if diarrhœa is present, Iodine does not act favorably. Chronic catarrh of scrofulous and mercurialized individuals, or remaining after croup or other acute affections, or complicated with chronic pharyngeal catarrh, are affections lying within the range of Iodine. The most prominent symptomatic indications are the following: Disposition to take cold, with long duration of the acute stage; the larynx is painful when pressed upon; burning, sore pains in the larynx confined to a definite spot, felt especially during cough; embarrassed respiration; wheezing inspirations, causing real attacks of dyspnœa, especially at night; a good deal of hawking, with difficulty in bringing up tenacious mucus; a high degree of hoarseness, even aphonia; tickling in the larynx, frequently causing paroxysms of cough without expectoration, or else with scanty expectoration of a tenacious mucus, sometimes mixed with streaks of blood. The general organism is very much affected by the disease. The presence of ulcers points particularly to Iodine."

Dr. Hughes says: "Its true action is one of a de-

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pressant character, exerted upon the lacteal vessels and mesenteric glands, giving a sluggish taking up of the fatty elements of the food by the lacteals, and an insufficient elaboration of their contents by the mesenteric glands; and we have at once a most important channel of nutrition choked up and rendered useless. The fatty aliments being those taken up by the lacteals, the emaciation becomes more rapidly apparent than if it had been the albuminous constituents of the diet whose supply was cut off. The action on the glands and the emaciation of Iodine is thus a prominent symptom. It has a specific action on the salivary glands, the liver, the glands of the generative system and the thyroid. Upon the glands of the generative system it exerts a depressing and atonizing influence. The mammæ and testes have more than once wasted away and disappeared under its use; and a diminution of the functional energy of the ovaries makes it probable that these are similarly affected. The most marked effects of Iodine are: Over-excitement of the whole nervous system; ebullition of the blood and pulsations over the whole body, greatly increased by every effort; trembling, tottering gait; great debility, atrophy; extreme emaciation; general œdema; pulse accelerated, hard and small; hectic fever; variable appetite, either excessive or absent; digestion very feeble; dyspnœa; suffocation; out of breath on going up stairs, with violent palpitations and cramp-like pains about the heart on the least effort."

DOSE.—First three decimal attenuations.

AGGRAVATION.—By exertion; in a warm room, and from wrapping up warm generally.

AMELIORATION.—From cold air and after sleep.

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Ipecacuanha.—Constant great and long continued nausea; vomiting gives no relief, the nausea still remaining. Hæmorrhages from all the orifices of the body, accompanied by nausea. Severe, suffocative cough, the chest seems full of mucus, but does not yield to coughing; asthmatic cough with excessive mucous rattling in the lungs; loss of breath when coughing with great paleness of the face. Incessant sneezing with large secretion of mucus in the nostrils.

The cough of Ipecac has not an organic base, but is of a simple catarrhal origin, mixed up with a neurotic element. It is a loose, spasmodic cough, with spasm of the bronchial tubes, and they are loaded with mucus. Dr. Hirschel says: "Catarrhal, or spasmodic *titillating* cough, or *suffocating cough*, with dyspnœa, nausea, vomiturition, especially at the end of the paroxysm, or with expectoration of a scanty, albuminous, *nauseous* mucus; or if mucous râles and vomiting of food are present. The inclination to vomit and the absence of every inflammatory irritation, and the tendency to resolution are indications for this remedy. Gastric catarrh, bronchial asthma, more in bronchial than in laryngeal affections. In whooping cough only towards the end. It has special relations to the vagus, and suits all women and children."

Dr. Nichol says: "Ipecac is one of the principal remedies for bronchial catarrhs of infancy and childhood; in action it closely resembles Tart. em. It is almost indispensable in those peculiar attacks, partly neurosis, partly phlogosis—a kind of mixture of asthma and bronchitis—which frequently occur in young children, and which are so fatal in the old school. It is indicated by loud and sonorous mucous râles in the chest, with wheezing respiration. There is great dyspnœa, coming on in paroxysms in the

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evening, continuing with slight remissions during the night, and intermitting distinctly through the day. The cough is convulsive and suffocative, relief partially from vomiting. During the vomiting the face assumes a bluish hue, and bleeding from the nostrils may take place. A slight degree of spasm of the glottis is not unfrequent, and there may be convulsive twitches or even spasmodic rigidity of the body of the child. Sometimes, in spite of the mucous râles, the cough is dry; though, as Baehr remarks, this is certainly not according to its physiological symptoms." If, instead of the usual tenacious and scanty mucus, a large quantity of simple catarrhal mucus accumulates, so that the cough is preceded and accompanied by loud râles, and every paroxysm of cough is attended with vomiting, excited by the least quantity of food: Ipecac is the certain remedy. In recent cases of asthma, especially in the young, to arrest the paroxysm Ipecac is equal to any remedy we have, where we have spasmodic constriction of the air passages and the bronchial tubes are loaded with mucus, there is much nausea, the face is pale and cold, and covered with sweat.

For acute hæmorrhages from the lungs, no remedy is more frequently indicated; the great key for its selection being *great and long continued nausea*, with spasmodic suffocative cough; much rattling of mucus and blood in the bronchi. Blood very dark, and mixed with mucus. Constant taste of blood in the mouth. If there is organic heart disease, Digitalis will take its place.

DOSE.—The first three decimal triturations of the root.

AGGRAVATION.—At night; by exertion, and in warm air.

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AMELIORATION.—By rest, and closing the eyes and mouth.

Kali Bichromicum.—Cough, with expectoration of tough, stringy mucus; adapted to the second stage where the mucus appears to be loose, but it sticks to the parts very tenaciously, and can be drawn out in long strings. Chronic catarrh affecting nose, fauces and larynx; parts smooth and red. Fleshy people, with light hair and eyes. More useful in catarrhal diseases of the air passages than in genuine phthisis.

For sub-acute and chronic tedious cases of cough, where the large bronchi, trachea, larynx and fauces are involved. The cough seems loose and what is expectorated is very sticky and ropy, can be drawn out into long strings. Dr. Meyhoffer says: "Inhalations, and the internal use of Kali bi. form our standard course of treatment in those numerous cases of common bronchitis vacillating between the acute and the torpid, inveterate character of the disease. A certain degree of irritation, vascular congestion, and moderate muco-purulent expectoration marks the morbid state ready to give way to the specific working of this salt. Inhalations, however, do good service in bronchial dilatation, with fœtid breath and expectoration. The sputa soon undergo a favorable change of aspect, while they lose at the same time their offensive odor and diminish in quantity. If the catarrh be attended by periosteal or rheumatic pains of a chronic nature, all hesitation as to the selection of the medicine must subside. Dr. Hirschel says: "Its characteristic symptom is a *smooth or follicular inflammatory redness of the pharynx and fauces,* with its dry, titillating cough and ulcerative pain in the larynx; it suits tedious cases." Dr. Lilienthal says: "It suits best fat, chubby children. Onset gradual and insidious;

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constant hoarse voice; cough at intervals, hoarse, dry, barking, metallic; deglutition painful; tonsils and larynx red, swollen, covered with false membrane, difficult to detach, with expectoration of tough, stringy mucus." Dr. Guernsey says: "Kali bi. Cough with expectoration of tough, stringy mucus; it sticks in the throat, causing a choking sensation, sticks to the tongue, teeth and lips, and in attempting to remove it from these parts it will be drawn out into long strings." For chronic hoarseness in laryngitis, it is one of our most useful remedies. Coughs up casts of elastic fibrinous nature; loud mucus râles; wheezing, rattling respiration when asleep.

DOSE.—First six triturations.

AGGRAVATION.—In the morning; after eating and from cold.

AMELIORATION.—In the evening and from heat.

Kali Carbonicum.—Cough brought on from cold, damp weather. Cough very violent, mostly dry, commencing at 3 A.M. Severe stitching pain is the most characteristic symptom of this remedy. Chronic, organic coughs. Lower portion of right lung.

In emaciation and debility, with a disposition to tuberculosis. Where there is a dry cough, invariably aggravated, about 3 A. M.; hectic fever and night sweats, with many stitching, darting, shooting, cutting pains, this remedy is invaluable. It seems to act on the system so as to produce dryness of the serous membranes, which gives rise to the stitching pains. the great leading characteristic of the remedy. Suppuration of the lungs, with great emaciation and debility, accompanied by profuse night sweats, affecting especially the head and chest. Excessive dryness of the scalp, with falling off of the hair. Great lia-

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bility to take cold at every change of the weather; great irritability with much anxiety, fever and tendency to start from the least noise. Rheumatic subjects whose mucous membranes are very dry and irritable, with a dry, racking cough, associated with stitching pains in the chest in cold, damp weather. The breathing becomes difficult and labored after the frequent paroxysms of dry coughing; cough when first waking, without expectoration. Stitching pains that come on during rest, with extreme tympanitis.

DOSE.—First up to the thirtieth; first three being most useful.

AGGRAVATION.—At night, especially after midnight, by all kinds of motion, and especially in damp, cold air.

AMELIORATION.—By warm, dry air and rest.

Kali Hydriodicum.—Especially useful in scrofulous or syphilitic people, who have been thoroughly saturated with Mercury. Secondary and tertiary syphilis, where the patient suffers much from chronic rheumatism. Mucous membranes of the mouth, air passages and kidneys chronically inflamed. Fetid odor from the nose and mouth, from chronic catarrh and ulceration of those passages. Chronic nasal catarrh in its worst form; ptyalism. Degeneration of the mucous membranes. Mucous phthisis, with purulent

The action of this remedy is very similar to Iodine, especially in scrofulous glandular swellings, and goitre; but differs in many points. Dr. Meyhoffer says: "The lower dilutions, 1st and 2d, from four to eight drops at a dose, form one of our standard prescriptions, whenever no special symptoms indicate the use of another drug. In glandular swellings it cannot be omitted. Dry, irritating cough, with scanty, frothy, rather than mucous expectoration, or none at all; obstinate tickling and irritation in the tra-

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expectoration, associated with exhausting night-sweats. Asthma in young people that are growing rapidly, associated with rheumatism. All forms of scrofula, with enlarged glands; severe nightly bone-pains. Profuse purulent mucous secretions, very sensitive to the least cold, damp air.

chea; prolonged expiration with sensation of tightness in the chest." Dr. Hitchman says: "Kali hy. is beneficial, indeed often of great service in those cases where there exists a considerable degree of irritation in the bronchial tubes, especially the larger channels, with hollow, dry cough, day and night, but worse towards evening; or cough with scanty, viscid, ropy expectoration; heat in the chest; burning, tickling irritation in the laynyx; quick, anxious, laborious respiration, with hoarseness; abdominal pains, slight, but at the same time most insiduous, dangerous and fatal in their ultimate results. They are augmented by pressure; fullness and tension of the belly, particularly a *deep-seated tightness*, as if the integument and muscles were gilded over; too tightly stretched, and thickened peritoneum or serous membrane; coughing and deep breathing are painful, with fever and emaciation." This is one of the best remedies we have for phthisis associated with asthma, but to get its best effect, it has to be given in large doses, of from one to five grain doses of the crude drug. Some cases the first dec. will be strong enough. Symptoms are: severe coryza; nose red and swollen, with profuse, watery nasal discharge; constant sneezing; dry, hard, barking cough, afterwards accompanied by a copious, greenish expectoration; great oppression of breathing, with loss of voice; suffocative oppression and arrest of breathing; the constriction of the chest is so great that the lungs cannot be inflated by the greatest effort of the patient, and is aggravated

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by rest; patient must move about to get relief; the dyspnœa is so distressing the patient declares he will die. In chronic cases, there is often a large secretion of mucus in the lungs, which, when expectorated, has a green appearance, from having been secreted and remained in the lungs a long time. Auscultation reveals an immense amount of bronchial spasm, as indicated by the whistling, wheezing noises all over the chest; has sharp, violent stitches in the chest, associated with many rheumatic symptoms throughout the body generally, with emaciation and great debility. Adapted to both the dry and humid asthma, but acts best in the dry form.

DOSE.—First to the tenth, the first two being the most useful.

AGGRAVATION.—In cold, damp weather, and rest.

AMELIORATION.—By motion, and in warm, dry air.

Kali Chloricum.—Has a specific action upon the buccal mucous membrane and mucous follicles of the mouth. Follicular ulcers upon the inside of the cheeks and tongue. Aphthous ulcers cover the whole mucous surface of the mouth; mouth filled constantly with saliva; glands enlarged and sore; gums inflamed and bleed much; burning, stinging blisters on the tongue and buccal cavity, with great heat in the mouth. Syphilitic subjects.

In the last stages of phthisis, where we have aphthous sore mouth, no remedy can equal this, if used as it should be. My favorite way of administering it, is to let the patient put a small chrystal of the Chlorate in the mouth, and suck it until all is dissolved and then swallowed. If this is repeated every one or two hours, the majority of cases will be cured in from two to six days.

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Kreosotum.—Putrid diseases, with great acidity of the secretions. Disposition sad and irritable. Paroxysmal moist cough, the lungs being loaded with mucus, expectorated with great difficulty; patient has to cough a long time. Fœtid sweat of the feet, that are often œdematous. Complexion livid. Tall, slim people. In women, the menses are too frequent, too profuse and last too long.

In organic affections of the mucous membrane of the bronchi, this is a remedy of great value. Its symptoms greatly resemble those of Pulsatilla, the distinction being this: the cases adapted to Kreosote are more deeply seated, have lasted longer, and in the case of women the menses are too often, too profuse, and last too long; whereas, in Pulsatilla, the menses are apt to be delayed and scanty. Kreosote is adapted to coughs that have passed from the dry, first stage, and the second stage has fully set in; the cough sounds very loose, the upper bronchi being loaded with mucus but expectoration is very difficult. The cough has much of the nervous element about it, which makes it paroxysmal in character. Marcy and Hunt say: "Constant spasmodic, violent cough, accompanied by violent retching; the expectoration copious, mucous and purulent; the patient cannot lie down without great distress; stitching pains in the chest; bitter taste in the mouth; cadaverous breath; frequent greenish, watery diarrhœa; hectic fever; copious secretion of the mucous membranes, and abscesses of the lungs, which are excessively offensive in character, accompanied with depression of nervous power. In these conditions," says Dr. Kurtz, "Kreosote is much more effectual than Arsenic, which is usually prescribed." Cough with pain in the chest and sternum compelling the patient to press the hand on it; frequent desire to take a long breath from oppression

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of the chest; shortness of breath, with sensation of heaviness on the chest; stitches in the chest, above and in the region of the heart, with oppression of breathing in the right side, extending under the shoulder blade, arresting the breathing. The chest feels bruised, especially the sternum. Patient wants to sleep all the time, and is extremely irritable.

KREOSOTE IN PHTHISIS.—Since its introduction by Bouchard, in 1877, Kreosote has steadily grown in favor. By its use it is claimed that there is diminution of cough and expectoration, reduction of fever, increase of appetite and of weight, and clearing up of consolidations. The dose is six or seven drops daily, though this may be increased with benefit. The treatment should extend over several months.

Dr. Rosenbusch, of Lemburg, prefers the injection of Kreosote into the tissues of the lung. About eight drops of a three per cent. solution of Kreosote in almond oil were injected in each of two spots by means of a Pravaz syringe with a needle 6 to 8 centimeters in length, using strict antiseptic precautions. No hæmorrhage followed.—*Whittaker, Annual of Universal Medical Sciences*, 1889.

DOSE.—First to the thirtieth; first three most useful.

AGGRAVATION.—Open air, morning and evening; by motion and eating cold food.

AMELIORATION.—From warm air.

Lachesis.—Throat exceedingly sensitive, cannot bear the least touch of the finger. When anything touches the larnyx, it is not only sensitive, but feels as though he would suffocate; touching

In the first stages of phthisis, especially in women at the climacteric, this remedy is frequently suitable. Through the vagi it has a powerful action upon the lungs, and when

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the throat causes a dry, hacking cough; dry spasmodic cough, worse nights, with a choking sensation in the throat; empty swallowing is perfectly agonizing. All symptoms greatly aggravated after sleep; patient is very unhappy and distressed after sleep. Women have frequent hot flashes, especially at the climacteric; cannot bear any pressure, not even the clothes, on the uterine region or upon the neck; keep constantly lifting the clothes from the abdomen and throat.

the cough, or asthma takes on a neurotic or spasmodic action, Lachesis will often be found invaluable. Dr. Guernsey says: "Cough,. excited by pressing, even lightly, upon the larynx, clothing must be removed from about the parts, its pressure excites the cough; cough as soon as one *falls into a sound sleep, often with choking, as if suffocation were inevitable.* Cough excited by a sensation as if a crumb of bread were sticking in the throat, or some other substance, with frequent hawking and swallowing." Dr. Holcomb says: "Lachesis acts beautifully for tickling, worrying night cough, with sensation of a lump in the throat, sensitiveness of the larynx, and especially when after a long, dry paroxysm there is suddenly a profuse expectoration of frothy mucus." Dr. Meyhoffer says: "Lachesis and Naja always contribute to allay the harassing cough, secondary either to nervous palpitation or organic alterations of the heart. Deficient nervous influence of the parvagum, dilitation and fatty degeneration of the heart constitute the sphere in which these poisons display their restorative influence." Dr. T. Nichol says: "Lachesis—the Belladonna of chronic diseases—is suitable to children suffering from hydrothorax, or where there is a largely bloated or lymphatic appearance; shortness of breath after a meal; tight breathing, dyspnœa and oppression of breathing, with aggravation after eating; suffocative

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feeling in a recumbent position, or when touching the neck. Spasmodic constriction of the chest, obliging the patient to rise from bed and to sit with the trunk bent forward; slow and wheezing breathing; desire to take a deep breath, especially when sitting."

DOSE.—Thirtieth attenuation.

AGGRAVATION.—After every sleep; at night; touching the throat or larynx, and in cold, damp weather.

AMELIORATION.—While eating, and from warmth.

Lycopodium.—Great quantities of red sand in the urine. Much pain in the back previous to urinating, relieved by urination. Excessive accumulation of flatulence in the stomach and bowels. Constant sensation of satiety, the least morsel of food fills him up to the mouth; much borborygmus, especially in the left hypochondrium; constant sensation in the abdomen like a pot of yeast working; obstinate constipation. Great disposition to take cold at every change of the weather, with cold, clammy night sweats, mostly on the chest and head. Loose, rattling cough, with great difficulty in breathing during the period of coughing. Fan-like motion of the alæ nasi, in diseases of the lungs; humid asthma, with much debility.

This is one of the most frequently indicated remedies we have in phthisis, and no remedy can be given with more confidence as to its curative effects. In action it greatly resembles Pulsatilla, Hepar and Kreosote. The cough is loose, rattling, but expectoration is not easy; sounds very loose, but remains in the lungs very tenaciously. The sputa is thick, yellow, or greenish. Dr. Meyhoffer says: "A long time was necessary to conquer my repugnance to the use of Lycopodium, excited by the exaggerated laudations of its medicinal virtues which I had been condemned to listen to; now I have, on the other hand, to guard against falling into the same error myself. The fact is, since I learned to appreciate its efficacy in chronic pneumonia, I have not failed

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to observe also its vitalizing influence in those forms of bronchitis characterized by copious muco-serous, or muco-purulent secretion. These morbid phenomena being habitually the result of more or less serious alterations, it follows that Lycopodium acts favorably in emphysema, dilitation of the air-tubes and senile catarrh. Constant tickling cough, worse at night, numerous loud mucous rattles, with rare and scanty sputa, are symptoms lying especially within the range of its action. But the varieties of bronchitis above mentioned are often attended or complicated by the phenomena of abdominal vascular obstruction and atony of the alimentary canal, or by those of the acid diathesis. The signs which arise in such circumstances, as congestion of the liver, flatulency, obstinate constipation, cachectic complexion, red gravel in the urine, and lithic acid dyspeptia are all indications for this drug. Low dilutions are not ineffectual, but higher ones work better." Dr. Baehr says: "It is suitable for old people, if emphysema and marked changes in the bronchial mucous membrane have taken place; there is constant tickling in the throat, loud râles with scanty, or unfrequent expectoration, of a gray and saltish taste; nightly exacerbations. Usually, Lycopodium is indicated in moist mucous, or muco-purulent coughs, but it has acted well in some cases of dry cough."

Dr. Hitchman says: "Lycopodium will almost invariably afford signal relief when there is fluent coryza with cough and hoarseness; stuffing of the nostrils; formication or ant-like crawling in the wind-pipe at night; dry cough in the morning; cough after drinking; cough which affects the chest; a loose cough with spitting of purulent matter, like con-

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firmed consumption; short breathing of children; constant oppression with suffocation on doing the least work; painful stitches in the left part of the chest, with bruised feeling; beating of the heart in bed; herpetic spots on the neck and chest; pain in the loins in bed; stitches in the back after stooping; dragging in the shoulder blades; stiffness of the nape of the neck; boring pains in the arms; twitching in the arms during sleep; dry skin, and the patient complains of having lost all strength in the arms and having cold feet; moreover when the cough is troublesome and materially worse at night, and attended with thirst, quickness of pulse, subsequent tendency to moist skin, expectoration grayish, saltish or yellowish, with oppression about the bronchial tubes, this medicine is strikingly indicated." Dr. Pope says: "Few medicines are so valuable in pulmonary phthisis as this, when persistently used. The cough, gastric irritation, exhaustion and intercurrent attacks of pleurisy are wonderfully mitigated by it." Expectoration of large quantities of pus; cough day and night; hectic fever; circumscribed redness of the cheeks; great emaciation of the upper part of the body, while the lower is enormously distended. C. Pearson, M. D., says: "Where the right side is more affected, the cough loose, full and deep, *sounding as though the entire parenchyma were softened, the patient raising a whole mouthful of mucus at a time*, which in color is a light rust, not much unlike that of Bryonia, but not so thick, more stringy and easily separated, and if, in addition, there should be present *fan-like* motion of the alæ nasi, the 200th is certain to give relief."

In prescribing Lycopodium, its action on the digestive organs, liver and urinary organs should never be lost sight of. The digestive symptoms, such as

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flatulence and *constipation*, together with the *red sand* (lithic acid) in the urine, are always the great key-note for the administration of this remedy.

In emaciation and debility, where Lycopodium is indicated, there will always be found many dyspeptic symptoms present, with an immense accumulation of gas in the stomach and bowels; the stomach is acid, and the least morsel of food seems to fill the patient full up to the throat. For Humid asthma of long standing, where the digestion is greatly perverted, with excessive accumulation of gas, which might well be called *flatulent asthma*, relieved by eructations of gas, Lycopodium will be found a sovereign remedy.

DOSE.—15th, 30th and 200th; the 30th being the most useful.

AGGRAVATION.—4 P. M.; exertion; lying down, and cold, high winds.

AMELIORATION.—Continued motion; forenoons; and from warm food and drink.

Mercurius Solubilis.—Symptoms all greatly aggravated at night, and in cold, damp weather. Spongy gums that bleed easily; salivation; thick yellow-coated tongue, or red like fire with very fœtid breath, aphthæ of the mouth and fauces. Enlarged salivary glands. Great thirst. Much perspiration that does not relieve. Jaundice. Watery, serous diarrhœa, or muco-sanguinolent stools. High-colored urine. Hectic fever, with dry cough;

In phthisis, after the primary stage has been nearly subdued by Aconite, Belladonna or Bryonia. The cough is dry and just passing into the moist stage, and is greatly aggravated at night. In chronic cases, where the bronchial tubes are involved, and there is a copious secretion of mucus or muco-purulent sputa, with exhaustive night sweats. Dr. Hirschel says: "How the Allopaths, and more particularly their pa-

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roughness and burning down the sternum, showing that the mucous membrane is inflamed. Ropy sputum. Chronic nasal catarrh; in scrofulous people, with induration of the glandular system.

tients, are to be pitied that their school should lack a knowledge of Mercurius solubilis as a cough remedy! Where is there a more certain, a more specifically acting remedy for the appropriate kinds of cough of a catarrhal, inflammatory, organic nature, running from the fauces through the trachea, and down to the finest bronchi; decisive in acute affections, ameliorating in the chronic; slime-loosening, resolvent, restorative? Where there are *roughness, burning, feeling of soreness*, from the fauces down to the sternum, hoarseness of voice, dry cough, raw, concussive, exhaustive, naturally exacerbated; sputum ropy, watery, spittle-like, nasty, bloody; catarrhal headache; coryza; diarrhœa; fever; non-ameliorating night sweats;—here is the real province of Mercury. Its place is somewhere after Aconite, before Bryonia or Pulsatilla or Hepar or Tart. em.; also ushering in the turning point, critically intervening, so that the last mentioned may finish the affair. Mercury is a sovereign remedy for inflammatory bronchial catarrh." Dr. T. Nichol says: "Mercurius sol. is an excellent remedy for capillary bronchitis. The cough is dry, racking and violent, especially in the evening, until midnight, excited by a tickling or sensation of dryness in the chest, with expectoration of yellowish, tenacious mucus, sometimes tinged with blood. Each paroxysm of cough is preceded by anxious oppression, with hoarseness and caryza; violent fever, with a disposition to perspire, which gives no relief; the tongue is thickly coated, and the alternate chills and heat are succeeded by ex-

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hausting sweats. This remedy acts best in repeated doses of the fourth and fifth trituration, dry on the tongue. In chronic bronchitis, paroxysms of cough at night, with coldness during the paroxysms and distress for breath; there is a good deal of yellow muco-purulent expectoration, or there is raising of sweetish or saltish mucus and blood; soreness and ulcerative pain in the air passages, especially during the cough, and the cough may give rise to nausea and vomiting." One of the most prominent indications for this remedy is a *constant alternation of chills and fever;* the fever is often very high, with a remarkable sensitiveness to the most trifling changes of temperature; thick, yellow-coated tongue, with diarrhœa, and a great longing for icy cold drinks, although they aggravate the cough. In pneumonia, Dr. Muller says: "The hepatization of a portion of lung continues, and the critical sputa are entirely wanting; the cough is dry; not frequent; very rough and fatiguing, with violent irritation and urging to cough; the dyspnœa remains unaltered, the fever is continuous and lentescent, with profuse and exhausting sweats; the urine is scanty and high colored; jaundiced skin; there is gastro-intestinal catarrh, and the patient has a scrofulous or dyscrasic organism." Dr. Baehr says: "The selection of Mercury in broncho-pneumonia may be justified by its admirable action in bronchitis, for it cannot be denied that the greatest danger proceeds from this quarter, and that, after the removal of the bronchial symptoms, the remaining pneumonia is comparatively insignificant. A third form of pneumonia, which is particularly adapted to Mercury, is the catarrhal form, or lobular pneumonia, which has an entirely different meaning from the former. As soon

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as we have reason, in a case of bronchitis, to suspect the formation of small foci of exudation, Mercury will first commend itself to our judgment as a remedial agent, and we shall have before our eyes an image of epidemic influenza. In tubercular pneumonia we have never noticed any good effects from Mercury. In phthisis caused by syphilis, Hartmann says he has cured several cases by it perfectly. I commenced the treatment with several doses of Mercurius sol. when syphilitic ulcers were still visible in the throat, extending deep down, involving the larynx, occasioning hoarseness and that ominous cough with irritation, together with the burning and tickling in the region of the larynx. *The red precipitate* often does better than the solubilis. And if they have been poisoned with Mercury, give Nitric acid." In the last stages of tuberculosis, with ulceration of the lungs, accompanied with aphthous ulceration of the mucous membrane of the mouth and intestinal tract, Mercury will be found of great service. The Mercurius solubilis acts best on women and children, and the corrosivus upon men. In deep-seated organic cases of asthma, associated with bronchitis, and great discharge of mucus from the lungs, Mercury will often do good service.

DOSE.—From the second to the thirtieth; the third decimal trituration being the most useful.

AGGRAVATION.—Evening and particularly at night, from heat in bed; in cold, damp air; wet weather; during perspiration, and from motion.

AMELIORATION.—From rest; during the day and work.

Mercurius Protoiodatus.—Where secondary syphilis is at the

In phthisis, where the patient has had syphilis, or the

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foundation, with chronic nasal and pharyngeal catarrh. Enlarged and indurated glands, especially the parotid and inguinal. The tonsils and buccal glands are greatly enlarged, inflamed and very painful, with constant flow of tough, ropy mucus. The mucous membranes raw, the epithelium being entirely destroyed; complete destruction of the respiratory mucous membrane, with loose, rattling cough, and copious muco-purulent expectoration.

subject is very scrofulous, and is a constant sufferer of catarrh, this is a remedy of great value. The cough is inclined to be loose, the bronchial mucous membrane seems to be undergoing complete solution on account of the great secretion of mucus. The mucous membrane of the nose and pharynx is greatly congested and swollen, especially that of the nose; in many cases it is impossible to breathe through it; the breath is extremely fœtid. In chronic tubercular sore throat and laryngitis, the fauces and epiglottis have a deep, livid purplish hue; the secretions are thin and acrid, frequently with ptyalism, and the breath is extremely fœtid. There is a vast amount of mucus in the nose, much of which descends through the posterior nares into the throat. The cough is very loose, and expectoration quite easy. Bowels inclined to be loose; dark red urine, and the tongue is coated thickly yellow.

Dr. Meyhoffer says: "Iodide of Mercury corresponds more particularly to subacute processes arising from the influence of cold or atmospheric variations; protracted cases, after Belladonna, when the parts are much swollen, dark colored, with much hawking, coughing, and viscid muco-purulent expectoration, particularly in the morning. In follicular laryngitis, it has been highly commended in the more acute forms, from the 1st to the 3d trituration.

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DOSE.—The first three decimal triturations.
AGGRAVATION.—In a warm room, and at night.
AMELIORATION.—In cool air, and active exercise.

Millefolium.—Active or passive hæmoptysis.

This remedy has a special action upon the vascular capillary circulation, controlling both active or passive pulmonary hæmorrhage. Hartmann says: "In almost every variety of hæmorrhage, and especially pulmonary, Millefolium is a splendid and indispensable remedy, more especially in the fleshy and robust; the spitting of blood is unattended with cough, or the cough is very slight and is caused by the newly accumulating blood; at the same time there is bubbling up in the chest, with a sensation as if warm blood were ascending in the throat, gradually increasing in intensity until blood is raised." Spitting of blood, with violent palpitation of the heart; much excitement, accompanied with a feeling of great oppression of the chest. Active hæmorrhages from deep ulcerations in the lungs.

DOSE.—Tincture, one to five drops every half hour.
AGGRAVATION.—Evening and at night.
AMELIORATION.—During the day.

Muriatic Acid.—Acts especially upon the mouth and anus. Mouth and tongue excessively dry; tongue is heavy and seems paralyzed. Breath is excessively foul, from ulceration of the mouth; salivary glands inflamed, tender and swollen. Diar-

In the last stages of consumption, with aphthous ulceration of the mouth and bowels, with watery diarrhœa and excessive debility, this acid is of great value. The aphthous ulcers of the mouth and throat slough and tend to run together. Aphthæ in

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rhœa. The anus is so tender it cannot be touched. Watery, putrescent, involuntary stools. Putrescence of all the fluids of the body. Low fevers. In women, menses too soon and too profuse, with great mental depression. Great sensitiveness to damp weather.

the last stages of tuberculosis denote great debility, and are often the harbinger of dissolution; consequently what we do has to be done at once. These mineral acids tone up the body so rapidly that often life may be prolonged when it would seem impossible. They should always be used locally as well as internally.

DOSE.—First three decimal dilutions.

AGGRAVATION.—Cold, damp air; stormy weather and exertion.

AMELIORATION.—Warmth; lying down and evening.

Nitric Acid.—Feeling as if sharp sticks were being stuck into the affected parts. Diseases depending upon some virulent poison, such as syphilitic, mercurial, and scrofulous miasms; secondary syphilis, with mucous patches, and tubercles; salivation from abuse of mercury. Spreading ulcers in the mouth and throat; mouth full of fœtid ulcers, with putrid smelling breath; sore throat discharging thin purulent matter; diarrhœa, with great pain in the anus as if it was fissured; painful, watery diarrhœa, of-

Phthisis in old broken down constitutions that have had syphilis, or are suffering from the effects of Mercury: patients are extremely weak, and perspire profusely at night, sweat smelling like horse's urine. Dr. Gorton says: "Nitric acid is an invaluable remedy in those dyscrasic conditions in which the blood is impoverished and the secretions foul, with weakness of the vital forces. I have used it for foul-smelling perspiration of the hands and feet, with gratifying results; sometimes the sweat excoriates the toes.

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ten mixed with mucus and blood. Proctalgia: urine smells like horses' urine, and is extremely offensive. In women, violent pressure as if the womb would be forced into the world; bloody leucorrhœa. Colliquative night-sweats, that are very offensive, with great emaciation and debility. Lean people, with bilious temperament, who take cold easily. Symptoms worse at night, especially after midnight.

It must be given in large doses. In the last stages of consumption, nitric acid may be indicated when there is loose cough, but, as a rule, it is inclined to be dry when this remedy is called for. Dr. Hirschel says: "Nitric acid has its sphere of action in chronic inflammatory forms of cough; in ulcerous or tuberculous processes of the larynx and bronchi; in pneumonia, which tends towards phthisis; in cirrhosis of the lungs; and especially in chronic catarrhs combined with angina pectoris, or diseases of the heart." Dr. Meyhoffer says: "Nitric acid, when there is great irritation, redness and ulceration of the epiglottis and larynx, with difficult and painful deglutition, violent dry cough, and nocturnal perspiration. The inhalation of 5 or 10 drops of the first dilution to an ounce of water has mitigated rapidly the troublesome throat symptoms in tubercular laryngitis. In syphilitic laryngitis, with hoarseness, aphonia, ulceration of the buccal mucous membrane, complete obstruction of the nose, or fœtid yellow discharge, with nose inflamed and swollen; coryza; dry cough, etc.; for the above it is well-nigh a specific. Dr. Holcomb says: "Nitric acid, 1st dec. dilution, frequently succeeds with those obstinate dry coughs after Atropine has failed. Nitric acid is an admirable remedy to eradicate the asthmatic disposition in patients suffering from secondary syphilis or from the poisonous effects of Mercury, especially if they are scrofulous subjects.

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DOSE.—First three decimal dilutions.

AGGRAVATION.—In the night, and warm room.

AMELIORATION.—In cold weather, and riding in a carriage.

Nux Vomica.—Choleric, sanguine, malicious, irritable people, who make great mental exertions. People that live high, and take intoxicating liquors; suffer much from dyspepsia, and are greatly troubled with sour stomach. Constipation, with frequent urging to stool. Greatly troubled with hæmorrhoids. Dry, racking cough, with great soreness of the stomach. Symptoms are greatly aggravated at 3 A. M.

The cough that is curable with nux vomica is of recent origin, of a dry, scraping character, and not founded on an organic base, but of a simple catarrhal nature, or of a reflex character from the spine or digestive organs. Dr. Hirschel says: "Nux vomica has only a limited application in cough, especially where the pharynx and fauces are affected. The cough is scraping, rough, with irritation in the throat, or under the upper sternal parts, with difficult expectoration of tough mucus on awakening from sleep in the morning; renewed or aggravated by vomiting and eating. Dry coryza, influenza or general simple catarrhs."

Dr. T. Nichol says: "Nux vomica is decidedly the leading remedy when the innervation of both branches of the pneumo-gastric nerve—its gastric as well as its pulmonary portion—is alike vitiated, and then the dyspepsia and the asthmatic affections are inseparable parts of one whole. Here, as Dr. Sutter remarks, the dyspeptic symptoms are the manifestations of the gastric portion of this deranged innervation, and the asthma, of the pulmonary portion of it, and in such cases Nux v. is at once suggested. Dr. Ruddock remarks, Nux is probably the

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best anti-spasmodic remedy to that condition of the digestive system which is the most common cause of irritation, which results in bronchial spasm. Nux vomica is about the best remedy we have for simple spasmodic asthma where there is no bronchial lesion, but a standing reflex excitability of the pneumogastric to impressions from without or through the stomach. One of the early cases which made Hahnemann famous was of this kind, and the Nux was given in material doses. Dr. Kidd also states that he considers it one of our best anti-asthmatics. While the gastric origin of the Nux asthma is often unmistakably evident, the paroxysm itself often depends upon congestion of the lungs, and it is a characteristic symptom that the *oppression is more troublesome than the spasmodic symptoms.* After the paroxysm subsides it leaves a condition of the digestive organs for which Nux v. is the great remedy. The tongue is coated with a thick yellow fur; slight nausea; flatulence and constipation; the breathing is not quite right."

DOSE.—From the first to the thirtieth.

AGGRAVATION.—3 A. M.; in open air; cold and vexation.

AMELIORATION.—Warm air and warmth in general, and wet weather.

Opium.—Dry, teasing titillating cough, day and night, but especially at night; cough of a cerebra origin. Face swollen and purple, with soporous sleep and stertorous breathing. Constipation, stools composed of round, hard, black balls. Much

In phthisis, when there is a dry, spasmodic, teasing, titillating cough, aggravated at night, where the brain seems to greatly sympathize, Opium will be found of great value. Dr. Hirschel says: "Opium-spasmodic cough with contin-

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perspiration that is cold and clammy. Bed feels so hard he cannot lie upon it. Frequent hot flushes. No pains are found in the opium cough. Bad effects from fright.

ued dry titillation, allowing no rest either by day or night. In every other case, as in the cough of phthisical patients, where it keeps off nightly paroxysms, it acts only palliatively by its narcotic quality; but for such cases large doses are necessary." Baehr says: "Never give Opium in cough with profuse expectoration of mucus, or it will tend to great dryness. It is erroneous to suppose that the narcotic effect of Opium suspends the desire to cough only for a short time, for there are many forms of cough where Opium only aggravates, and does not afford any relief, or affords relief only when administered in very large doses, to be followed afterwards by an increase of the cough. In our opinion Opium is admirably homœopathic to a spasmodic, dry, paroxysmal, titillating cough, which is especially tormenting at night, and has but a scanty expectoration. The fact that we have often cured a cough of this kind permanently by means of a few doses, entitles us to the belief that Opium is something better than a mere palliative in this affection. In the later course of tuberculosis, after suppuration had really set in, we have obtained speedy and real relief by means of small doses of Morphine, one-twentieth or one-fiftieth of a grain at a dose. Nor have we ever hesitated to avail ourselves of the narcotic properties of this agent." It is only useful in asthma in the reflex or nervous forms, the brain being the centre. There is tightness of breath, with oppression and spasmodic constriction of the chest; suffocative fits during sleep. The cough is dry and suffocative, with bluish redness of the face and dryness of the skin. A copious secretion of mu-

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cus always counter-indicates Opium. Morphine is often a valuable palliative, and the physician need not fear the effects of one-eighth, or, in some cases, one-quarter to a half a grain at a dose. These large doses will ward off the so-called hay-asthma entirely in some people. I know one physician that could not practice in the fall without his Morphine to ward off the asthma. Morphine, in the last stages of tuberculosis, is the only comfort and real blessing the patient has in this world, and the physician who would withhold this only comfort to a suffering mortal ought not to practice medicine.

DOSE.—First three attenuations of Morphine. First three decimal triturations, and the crude drug.

AGGRAVATION.—At night; during sleep, and from stimulants.

AMELIORATION.—From cold; motion, and during the day.

Phosphorus.—This is a true lung remedy and affects more favorably tall, slender people, with fair skin, sanguine temperament and very sensitive dispositions. Deep-seated organic diseases where death is inevitable. Sensation of weakness and emptiness in the stomach and abdomen: this emptiness aggravates all other symptoms, and is the ruling key for the use of Phosphorus. Great thirst, drinks large quantities of water; vomits whatever

In phthisis, when the disease is deeply seated, much emaciation accompanied with great nervous prostration, and more or less complicated, with gastric and intestinal disease, Phosphorus is a king of remedies. There is much anæmia and deliquescence of the blood, with frequent hæmorrhages of the lungs, of a dark fluid blood. The emaciation is accompanied with a dry, hard cough, the expectoration is frequently mixed with blood; the lungs more or

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has been drunk as soon as it becomes warm in the stomach. Stools slim hard and dry, evacuated with great difficulty, looking like a dog's. Diarrhœa, which pours out in great quantities, like water from a hydrant. Hard, dry, tight, rough cough. Obstinate, and copious hæmorrhages from the lungs, small wounds bleed much. Much heat in the back between the shoulders. Emaciated people that take cold very readily, are extremely sensitive to cool air, and suffer much with cold extremities. Great sexual desire or impotence. Degeneration of the brain and liquefaction of the spinal cord. Fatty degeneration of the liver.

less hepatized with much sanguineous infiltration of the parenchyma of the lungs. There is a great tendency to a watery, exhaustive diarrhœa, or much gastric irritability; the tongue is red at the tip and at the sides; nausea and frequently vomiting. A sensation of goneness, or great weakness in the abdomen, that aggravates all the symptoms. In copious and long lasting pulmonary hæmorrhages, Phosphorus is the best remedy we have. Dr. W. Arnold says: "The changes occasioned by it in the blood, and through the blood in the whole organism, have been overlooked for a long time. In numerous cases of poisoning by means of Phosphorus-matches, and by Phosphorus-paste, the changes in the blood are too conspicuous to remain unnoticed any longer. Almost all observers speaking on this subject describe the blood as being dark, even black, and of fluid consistence. As a rule it is thin, flowing, more rarely of molasses-like, or of more thick, flowing appearance. The blood is more fluid if Phosphorus does not kill quickly, but has a chance to effect changes in the blood in consequence of a more lasting action for several days. These changes, however, usually set in with great rapidity. The results of microscopic investigations of the blood offer important disclosures.

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Phosphorus occasions an important change in the blood discs; their decrease in consistency and circumference is very conspicuous. They become smaller, more extensible, and consequently can assume different forms; they change their form in many ways, especially in their passage through narrow vessels, and in their proportion to each other. One might say, almost, that Phosphorus acts as a dissolvent upon the blood discs. This action touches the blood cell-membrane more than the nucleus. Greater luster, a less granular appearance, irregular and less distinctly defined outlines,—these are the most conspicuous changes of the blood discs which can undoubtedly be ascribed to the direct action of Phosphorus. According to Rummel the destruction of blood-discs is the most essential phenomenon when Phosphorus has been introduced into the stomach, or injected into the blood. The blood-discs separate into hæmatine and globuline. The former floats as a purple coagulum in the plasma, or may even be dissolved therein, while the form of the latter is preserved. Another observation of Rummel is very worthy of notice for the explanation of hæmorrhages after Phosphorus poisoning. If a rabbit, into whose vena cruralis Phosphorus oil had been injected, was held head downwards, he soon saw red-colored plasma, which under the microscope was free from any blood discs, flow from the nose. The blood in this dissolved state had passed through the walls of the vessels. On opening a vessel, numerous blood discs could still be found."

This striking resemblance in the change of the blood, and especially of the blood-discs after poisoning with Phosphorus, shows us why it is of such wonderful efficacy in the cure of hæmorrhages. I once

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cured a case of hæmorrhage from the lungs in a tuberculous subject with Phosphorus, when the patient had well-nigh bled to death. Without any effort on the part of the patient, the blood would rise into his mouth, so that a quart-dish would be filled in half an hour; faintness would come on, and the hæmorrhage would cease for twenty-four hours, and then suddenly come on again. The man was so weak at the end of two weeks that he could not speak above a whisper. Aconite, Hamamelis, Millefolium, Belladonna and Ipecac, all had been tried faithfully and failed. After commencing the use of Phosphorus, he had no more hæmorrhages, and made a quick convalescence, remained well one year, and then died of pulmonary tuberculosis, without any return of the hæmorrhage. This confirms Raue's observation; profuse hæmorrhage, pouring out freely, then ceasing for some time. For deep seated organic affections of the lungs, with a short, dry, rough cough, Phosphorus is of inestimable value. Dr. Hirschel says: "The indications for Phosphorus in nervous cough are similar to Opium, and may also be compared with Belladonna and Drosera. In Opium one might say the titillation is the chief indication. In Phosphorus, the cough is more tormenting. The irritation from Phosphorus is not so continuous as that of Opium. In Belladonna, also, the cough is more mild—not so deeply seated. The similarity with Drosera consists in this, that in both the cough comes in paroxysms with intervals. The cough in Phosphorus is cut off short; rough, short, dry; between every single coughing sound there is a short interval, which is wanting in the Drosera cough. Where they follow one another in quick succession, the cough does not begin with deep inspiration, but the expiration prevails; the patient

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keeps coughing when lying down, without any necessity to sit up for it, and the fit does not terminate with expectoration or vomiting mucus, but ceases gradually. Neither does the Phosphorus cough come so apparently from the depth of the abdomen; the patients rather point to the upper or lower respiratory organs. It is quite certain that in such nervous coughs Phosphorus is a grand remedy, hence its splendid effects in stenosis of the glottis, in coughs from bronchial asthma, in angina pectoris. Phosphorus is of equally great value in catarrhal, inflammatory or organic diseases of the respiratory organs. We find it everywhere in laryngeal, tracheal, bronchial, pulmonary catarrh up to inflammation, even in the most croupous form, or terminating in pseudoplasmata and disorganization of the tissue. The painfulness of the larynx to the touch; the different pains, soreness, stitches, burning; the expectoration of foamy, sticky, purulent, salty, sweetish, brown, rust-colored, bloody mucus; the cough aggravated by speaking, laughing, eating, motion; hoarseness and aphonia; shortness of breath and orthopnœa; the great prostration, the fever—all of them prove the deeply penetrating action of this remedy; still showing its power in emphysema and tuberculosis. In a fit of coughing during measles, where the child for twelve hours steadily felt irritation to cough, and expectorated a little foam and blood, after all other remedies failed, a single dose of Phos. 2nd stopped it permanently. In pneumonia it always remains our sheet-anchor, and it prevents, in croup, paralysis and narcosis through the carbonized blood."

Dr. C. C. Smith says: "Phosphorus—goneness in the region of the stomach; hoarseness and aphonia in the evening; tormenting cough, tight and worse

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before midnight; painless diarrhœa; puffiness around the eyes; night sweat, especially during sleep; cough worse from eating and drinking, with bursting feeling in head; aphthous patches on roof of mouth and tongue." Dr. W. H. Holcomb says: "Especially when there is sensitiveness and dryness of the larynx, with a feeling as if it was lined with fur, and inability to utter a word, every effort to do so being painful; nervous exhaustion; suspected atrophy of the nerve tissues."

Baehr says: "Phosphorus, according to our own experience, is less adapted to phthisis as a whole than to single symptoms. It has to be used with caution, for no other medicine causes hæmoptœ early as Phosphorus. No other medicine disagrees so completely in the long run. The chief indications for Phosphorus are: continued hoarseness, with a distressing dry cough, sore feeling in the larynx and trachea; pain in the stomach after every meal; also retching and vomiting of mucus; continual diarrhœa, which is excited by eating, and after every meal; excessive excitement of the sexual passion."

Meyhoffer says: "Phosphorus will rarely much benefit the chronic catarrh of persons otherwise healthy; but it is admirably suited to the intercurrent, acute, or subacute attacks of bronchitis in emaciated, cachectic or young, overgrown invalids. The tendency to pulmonary congestion and catarrhal pneumonia, so often, under such circumstances, either the proximate cause or complication of bronchial irritation, is additional and important indications for Phosphorus, is also one of our chief remedies in broncho-pulmonary catarrh, resulting from dilatation or fatty degeneration of the heart. I am as

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yet unable to give an opinion as to the dose, the 3rd and 30th having served me equally well."

Dr. T. Nichols says: "Phosphorus is the principal remedy in bronchitis of any kind, when the inflammatory irritation threatens to attack the parenchyma of the lungs, and it is customary to administer it after the more acute symptoms have been subdued by Aconite. The cough is dry and hacking, with burning and tickling in the air passages, and stitches in the chest. It is aggravated by speaking, laughing, or drinking, and is followed by expectoration of a bloody, frothy mucus. There is also painful sensitiveness of the larynx, with hoarseness, or complete aphonia. The respiration is loud and panting, indicative of great oppression, and the pulse is hard and hurried, or rapid and feeble. Phosphorus seems useful in almost any dilutions, but the 6th to the 12th serves me the best."

Dr. C. Pearson says: "In incipient as well as confirmed phthisis, in persons of meagre, slender form, fair complexion, and strong sexual feelings; when in the lower lobes and of an asthenic type; in children and young people, of delicate constitutions, with dry, short cough, shortness of breath, great emaciation, tendency to diarrhœa, or perspiration. It is no specific for phthisis, but acts usually on certain states of lowered nervous energy, violent pneumonia, with sticking pains in chest, excited or aggravated by coughing or breathing also in pleuro-pneumonia; when they are violent and extend over a large surface, a large portion of the lung is inflamed, with dyspnœa the cough is dry, and the sputa *rust-colored.* Phosphorus is in many cases the only remedy, and it affords relief in from four to eight hours. Give three drops of the 3rd every two hours. (Where the cough

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is not so loose and rattling as for Lycopodium, or so close and tight as for Bryonia, the secretion being much less, but more profuse than for either Bryonia or Aconite, and in color somewhat like that of Lycopodium, but being of a *more dirty appearance resembling pus but thinner, and when falling on any hard, smooth surface, breaking and flying to pieces like thin batter.*")

In asthma, Phosphorus is often of great service, in the congestive form with symptoms of paralysis of the lungs, and the above characteristic symptom; the asthma being based on organic lesions of the lungs.

DOSE.—From the second to the thirtieth, the third being most useful.

AGGRAVATION.—Especially at night; cold air, and motion.

AMELIORATION.—Warm air; in the dark, and after sleeping.

Phosphoric Acid.—People who have been weakened by the loss of animal fluids, sexual excesses, or a long succession of moral emotions. Cerebral weakness from brain fag; patient can hardly be persuaded to speak, is indifferent to all about him. Painless, watery diarrhœa, with much rumbling in the abdomen, from much accumulation of flatulence; stools undigested.

In the first stages of phthisis, Phosphoric acid is often of great value. When there is great loss of strength, from the loss of vital fluids, as in sexual excesses, or impotence. The patient is indifferent to everybody and everything, cannot be interested in anything; has copious night sweats of a cold, clammy nature. It is to nervous debility what iron is to anæmia.

DOSE.—First three dilutions; or used in water, twenty drops of the acid to one pint of water and drink freely, a quart a day.

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AGGRAVATION.—From loss of animal fluids; mental work; at night, and cold, dry weather.

AMELIORATION.—Motion, warmth, and wet weather.

Pulsatilla.—Very affectionate people, with blue eyes, yielding dispositions, and easily excited to tears. Symptoms greatly aggravated in a close, warm room; patient craves fresh, cool air. Symptoms very changeable, well one hour and sick the next. Especially acts upon the posterior spinal nerves, as shown by the constant chillings,—the patient complains of being cold all the time. Weeps very easily, can hardly give her symptoms without crying; inclined to be fleshy, and is very affectionate. Women that are inclined to be fleshy, with delayed and scanty menstruation. Loose, rattling, racking cough that makes the stomach sore and causes emissions of urine at every paroxysm of coughing. Always has a very bad taste in the mouth in the morning from bad digestion; has a thickly coated white or yellow tongue; sour stomach from the least di-

In phthisis, where the bronchial mucous membrane is greatly involved. The cough is very loose, with copious mucous expectoration, accompanied with great soreness of the epigastric region and if in females, the urine is emitted at each coughing fit. Loose through the day and tight at night.

Dr. Hirschel says: "Pulsatilla is similar to Hepar; when given too early, even in the third dilution, it will produce aggravation and render the cough dry after rests, in Pulsatilla, like Hepar, suits only moist cough with copious mucous expectoration, especially when yellow, whitish, salty, towards the end of catarrhs, or in chronic catarrhs. Pulsatilla encroaches not so deeply upon the metamorphosis as Hepar, and is, therefore, only a palliative in chronic organic cases. It is especially indicated for mucous râles, where asthmatic disturbances arise

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gression in diet. Especially bad effects from rich, fat food. Inclined to mucous diarrhœa, worse at night. Flying rheumatic pains, that come on suddenly.

from the accumulation of phlegm (emphysema), with catarrhal irritation in the throat; amelioration in the fresh air; aggravation in the evening and at night. It is specific in those cases where the cough is moist through the day, with dry, titillating cough at night in a recumbent posture." Meyhoffer says: "What could we do without Pulsatilla in presence of copious muco-purulent expectoration in lymphatic and anæmic females. There is no remedy which corresponds so well with the irregularities of function in the reproductive organs, as well as with the symptomatology of the bronchial affection, so common to this class of women, as Pulsatilla. Nocturnal paroxysms of dyspnœa; gouty or rheumatic pains, flying about from one part of the body to another, worse at night, fix as characteristic symptoms the selection of this remedy."

Baehr says: "Pulsatilla is much more useful in chronic than in acute bronchitis, if the following symptoms prevail: cough principally at night, excited by itching in the trachea, with copious expectoration of mucus; the mucus is mostly white but frequently mingled with yellowish or greenish lumps, that impart to it an oily, offensive taste. Pulsatilla is next to indispensable in the bronchial catarrh of chlorotic females, which almost always, although not in every case, depends upon tubercles. If, in the case of children, an acute catarrh gradually changes to the chronic form Pulsatilla is a remedy of the first importance." Hæmoptisis, especially in women that have suppression of the menses; they are very tearful. The cough is loose and rattling, the expectoration is

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mixed with mucus and blood. The patient is chilly all the time. Asthma of a humid nature, especially in women with menstrual disturbances. There is congestion of the bronchial mucous membrane, and after the paroxysm the patient is relieved by raising large quantities of mucus. There is partial emphysema of the lungs. The prominent gastric symptoms produce, through sympathy, great depression of spirits, melancholy, anxiety, and great dread of suffocation. Short suffocative, and extremely difficult respiration, as if from want of sufficient air, or choked by some irritating substance; the patient is obliged to retain the erect posture; his movements are rapid and his whole appearance indicates great distress and anxiety; tongue loaded with a thick yellow, or white coating; breath offensive; frequent eructations; countenance pale, and the attack usually comes on at night.

DOSE.—First to the thirtieth; first three being most useful.

AGGRAVATION.—Warmth, especially a warm, close room; evening until midnight; lying down; and fat, rich food.

AMELIORATION.—In open, cool air; cold drinks, and motion.

Rhus Toxicodendron.—In phthisis that is brought on by cold, damp weather; always aggravated in cold, damp weather. Patient cannot lie long in one position, has to shift about constantly to get relief, which lasts but a short time, then he has to move

In phthisis associated with rheumatism, the patient complains of his joints being stiff, and he has a hard, dry, racking cough, worse nights and especially just before and during a cold rain storm. The case is apt to assume a typhoid form.

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again. Patient always gets worse after midnight. Great stiffness of the limbs before a storm. The patient is lame, the joints are stiff and pain greatly on first moving, after rest, relieved by continued motion. Fiery red tongue; putrid taste; after the first mouthful has no appetite. Looseness of the bowels, worse at night; stools involuntary with great exhaustion. Cough brought on by repeated drenchings in the rain. Terrible cough, which seems as if it would tear something out of the chest; brick-dust expectoration, raised with great difficulty. Vesicular eruption on the skin. Erysipelas.

Dr. Baehr says: "Rhus is in place if the local affection is so disguised by the constitutional disease that we seem to be dealing with typhoid fever, complicated with bronchial catarrh. The use of this remedy is suggested by great debility, a prostrate condition of the whole organism, symptoms of violent reaction, such as a rapid pulse, burning heat, dry skin and tongue, delirium, sopor, a short, distressing, dry cough, mostly at night, excited by motion, and every little cold current of air; tickling and feeling of dryness in the throat, down the trachea; the symptoms abate for awhile after a swallow of warm water or tea, but soon reappear again in the same degree, accompanied by tearing pains in the extremities, especially if they set in at the same time as the cough, in consequent of the patient being exposed to the influence of a *damp and cold air, or getting soaking wet:* the paroxysms occur in the night, attended with complete sleeplessness; the cough is complicated with coryza, and frequent spasmodic sneezing, or, in case of influenza, with typhoid symptoms."

Marcy and Hunt say: "Rhus tox.—Worse in the evening, at night, and with perfect rest; relieved by rising from bed and walking about. On the other hand, they are aggravated by external cold, while

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frictions and warm applications relieve them; they are aggravated by all rough movements or severe exertions." Dr. Boyce says: "Acute catarrh, the nasal, laryngeal, tracheal and bronchial passages seem stuffed up; commencing at about sunset, with sneezing and dry, hard, tickling cough; continuing very severe until midnight, when all the sufferings are relieved; but are renewed the next morning." In phthisis, complicated with pneumonia, expectoration of brick-dust or bloody sputa, raised with great difficulty; accompanied with low typhoid symptoms.

DOSE.—First to the thirtieth; first three the most useful.

AGGRAVATION.—While at rest, on beginning to move; before a cold rain storm; especially from getting wet while perspiring; from anything cold; at night, or getting cold.

AMELIORATION.—Continuous motion; warm, dry weather; wrapping up warm; hot drinks; change of position, and during the day.

Rumex Crispus.—Especially acts upon the mucous membrane of the larynx and trachea. Violent and incessant, dry, fatiguing cough, with little expectoration, aggravated by pressure, talking, and especially by inspiring cool air, and at night; cannot bear the cold air, covers up the head to exclude it; complete aphonia; sense of excoriation behind the sternum.

In the first stage of phthisis, where the mucous membrane of the larynx and trachea is involved, and there is a hard, dry, teasing, nocturnal cough, that is greatly aggravated by breathing cool air, especially at night, Rumex will give wonderful satisfaction.

Dr. C. Dunham says: "I have used Rumex chiefly in acute catarrhal affections of the larynx, trachea, and

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bronchi. In these cases it presents a close analogy in its action to Bell., Lach., Phos. and Causticum. Rumex diminishes the secretions and at the same time exalts in a very marked manner the sensibility of the mucous membrane of the larynx and trachea, exceeding in the extent of this exaltation any remedy known to us. The cough, therefore, is frequent and continuous to an extent quite out of proportion to the degree of organic affection of the mucous membrane. It is dry, occurs in long paroxysms, or, under certain circumstances, is almost uninterrupted. It is induced or greatly aggravated by any irregularity of respiration, such as inspiring cold air; by irregularity of respiration and motion of the larynx and trachea, such as are involved in talking; and by external pressure upon the trachea. The subjective symptoms are rawness and soreness of the trachea, extending a short distance below the supra-sternal fossa and laterally into the bronchi, chiefly the left; and tickling in the supra-sternal fossa and behind the sternum, provoking the cough; this tickling is very annoying and very persistent, and is only partially relieved by coughing. The cough is much worse in the evening after retiring. The mucous membrane of the trachea is particularly sensitive to cool air; the patient often covers his head with the bed-clothes to avoid the cold air, and refuses to speak for fear of increasing his cough."

DOSE.—First three attenuations.

AGGRAVATION.—Evening, after lying down, especially by inhaling cool air, and by pressure upon the larynx and trachea.

AMELIORATION.—By warm air, and in the daytime.

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Sanguinaria.—Cough that has passed into the second state and the lungs are filled with mucus, raised with great difficulty; rusty-colored sputa, in the second stage of pneumonia; excessive dyspnœa. Constitutional and severe cough, always attended with circumscribed redness of the cheeks; cough with coryza. Croup membrane very difficult to detach; constant and incessant dry cough on lying down at night, relieved by sitting up.

In catarrhal phthisis, this is a precious remedy for cough where the larger bronchial tubes are involved, and the stage of copious mucous secretion has set in. The cough sounds exceedingly loose, but the secretion of mucous is raised with great difficulty. Dr. Holcomb says: "I prescribe it in a certain troublesome harassing cough without marked inflammatory action, when you are uncertain whether you are dealing with a chronic bronchitis or an incipient tuberculosis. I use the first centesimal trituration of the resinoid. I have been astonished at the power of this remedy in such cases. It has done me more good in pulmonary diseases than any other single remedy. Calcaria 200th, one powder before breakfast and one powder of Sanguinaria 1st, an hour after each meal, for chronic bronchial diseases, has procured me more reputation and business than any other one prescription I have ever made. In moist cough, Sanguinaria 3d cent. trit., steadily persisted in for several days will arrest this catarrhal disease in almost any of its forms, although when there is headache, sore throat, red cheeks, pains in the breast, offensive breath and expectoration, or symptoms threatening pneumonia, it proves of very great efficacy."

Dr. C. C. Smith says: "Sanguinaria—emptiness of stomach, worse after eating, flushes to face, followed by hectic spots upon cheeks; constant tickling

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at entrance of larynx, causing constant cough, with a crawling sensation down behind the sternum; chest sore and painful to touch; hot streamings from chest to abdomen; cold hands and blue nails; breath and sputa offensive, even to patient; extreme dyspnœa; desire to take a deep breath, which is followed by intense pain in right side of chest; lassitude mornings; aversion to motion; stools predominantly loose; cough relieved by passage of fatus upward or downward." Marcy and Hunt say: "This is one of the best agents we have for the prevention, if not the cure, of consumption. We have used it with success in patients who were subject to distressing affections of the chest, repeated attacks of pneumonia resembling pertussis. Also in protracted catarrhal fever, which leaves obstinate cough and threatening consumption. The cough has generally been mitigated, the pulse diminished in frequency; the power of the whole digestive system increased; the appetite is always improved, or regulated in cases where it has been morbidly great. Chronic dryness in the throat; continual severe dry cough, with pain in the chest and circumscribed redness of the cheeks; tormenting cough with expectoration of mucus. The peculiar cough, emaciation and hectic fever of pulmonary consumption; hydrothorax, asthma, pneumonia, and pneumonia typhoides, pain in the chest, with cough and expectoration; burning and pressing in the breast and back; palpitation of the heart; burning of the palms of the hands and soles of the feet at night." Sanguinaria catarrh is first acrid, watery coryza, rawness of the throat, painful bronchial catarrh, which finally terminates in diarrhœa.

Dose.—First three triturations of Sanguinaria nit.

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AGGRAVATION.—Morning and evenings; noise, light, motion, and open air.

AMELIORATION.—During the day; quiet; and in the dark.

Silicia.—Chronic suppuration; has a wonderful control over the suppurative process, seeming to mature abscesses when desired. Great lack of vital heat, is cold and chilly all the time, cannot keep warm even when walking. Great disposition to take cold, even from the slightest draft of air. The head and chest is constantly wet with perspiration; copious night sweats; extremely fœtid foot sweat. Children with large, open fontanelles, and who wish the head covered up; rachitis with slow dentition. Obstinate constipation; the rectum does not have the power to expel the stools, the stool often recedes after having been partially expelled. Fistulous ulceration of the anus. In women, great chilliness during menstruation, with constipation. Caries of the bones and chronic suppuration of joints. Assails nutrition rather than the functions of an organ.

In phthisis, no remedy controls the suppurative process equal to Silicia. In organic diseases of the air-passages, where suppuration has taken place, with a suffocative, racking, loose cough, and copious expectoration of thick, yellow, greenish pus, or muco-pus, accompanied with hectic fever, great emaciation and debility and copious night sweats, this remedy is our sheet-anchor. As a remedy for chronic bronchitis, it is only second to Sulphur. Meyhoffer says: "I think it hardly possible to overcome radically the catarrh pituiteux of Lænnec without the intervention of Silicia. In this form of bronchial disease no other agent contributes so largely towards recovery. Not less beneficial are the effects of Silicia in bronchial affections of rachitic children. Hughes thinks that Silicia may find its place in chronic bronchitis with puriform expectoration, and it is one of the principal remedies

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in obstinate or severe cases characterized by racking cough, with copious expectoration of transparent purulent matter. The cough is suffocative, with oppression at the chest, and aggravated at night, and is sometimes accompanied by sore throat, with loss of breath when lying on the back and when stooping. All unite in prescribing the higher dilutions, and Baehr says that we have never derived any advantage from alcoholic attenuations, but always from the higher triturations."

Marcy and Hunt say: "This remedy embraces most of the symptoms that belong to the phthisical dyscrasia, consequently it is of great value for the constitutional condition in congenital or hereditary cases. The dyspeptic symptoms peculiar to consumption are also nearly the same as under Hepar. The symptoms that show themselves in the respiratory system are: roughness and sore feeling in the larynx, with dry hacking cough, causing soreness in the chest, hoarseness with cough; suffocative night cough; excessive continual cough with discharge of translucent or bloody mucus; vomiting of purulent matter when coughing; ulceration of the lungs; discharge of clear, pure blood, with deep, hollow cough; the chest painful as if bruised; shortness of breath felt on walking or exercising; weakness and oppression of the chest, with chilliness of the surface; oppressive heaviness in the region of the heart and palpitation when sitting still." This remedy is especially adapted to children that are inclined to rachitis, with large bellies and weak ankles; great difficulty in learning to walk, emaciation with ulceration of the lymphatic glandular system. The emaciation that calls for Silicia has been brought on by

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a long lasting organic disease of the lungs, or some other organ undergoing suppuration.

DOSE.—From the 15th to the 1000th, the 30th being the most useful.

AGGRAVATION.—Cold air; night, and after sweating.

AMELIORATION.—Warm air, and in a warm room.

Spongia.—Chronic hoarseness; dry, sibilant, croupy cough, with great dryness of the larynx; every secretion is perfectly tight and dry, with suffocative breathing,—patient must have the head high. Has a specific action upon the larynx and trachea. Goiter and indurated lymphatic glands.

In phthisis, Spongia corresponds to affections of the upper part of the respiratory organs, especially the larynx and trachea. The cough is croupy, dry, sibilant, sounding like a saw driven through a thin pine board, each cough corresponding to a thrust of the saw. Baehr says: "Spongia is characterized by a hollow, barking, dry, seldom moist cough, continuing all day, and likewise at night, in long-lasting, distressing paroxysms, sometimes accompanied with râles. The remedy is most appropriate for children, more particularly if the disease set in as laryngitis and gradually extended to the lungs. It is an excellent remedy in croupous bronchitis." "Often the patient is quite convalescent, when on very slight exposure the cough returns with redoubled violence—the most pressing dyspnœa, sibilant ronchi and violent convulsive cough. When this relapse occurs, Spongia is pre-eminently the remedy, even though it had not been given previously."—Dr. Nichol.

The first inflammatory symptoms should be subdued by Aconite. Spongia is not used as much as it ought to be in those hard, tough cases of what might

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be called dry bronchitis. There is an absence of inflammatory symptoms, but the patient has a terrible hard, dry, racking cough, slight expectoration and dyspnœa. In dry, spasmodic asthma, with severe dyspnœa on lying down, exertion produces great exhaustion in the chest.

DOSE.—First three decimal triturations.

AGGRAVATION.—Night; cold air; lying with head low.

AMELIORATION.—By warm air and head high.

Stannum.—Great weakness of the chest; the least exertion puts patient all out of breath; cannot answer questions, there is such debility, all centering in the chest; reading aloud, coughing, or the effort to expectorate, produces great weakness in the lungs. Feels so weak can hardly sit down, must drop down suddenly, but can get up very well. Great weakness of the legs, they cannot support the body. Can go up stairs nicely, but coming down stairs produces great faintness. Pains commence lightly, increase gradually to a very high degree, and then decrease again as slowly. Bronchial dilatation, with loose cough, and green, muco-purulent expectoration. Exhausting night-sweats.

In phthisis where the bronchial tubes are inflamed and dilated; the secretion of mucus is very great, of a green, yellow, or muco-purulent character, with a loose, rattling cough, accompanied with excessive prostration, especially centering in the chest,—Stannum will be found of great utility. Hahnemann says: "Rough throat, hoarseness, weakness and emptiness in the chest; the hoarseness was sometimes relieved by a fit of cough; mucus in the trachea, in the forenoon, easily thrown off by a slight cough, the chest feeling very weak, with faintness, and weakness of the whole body. Accumulation of mucus in the chest, with rattling breathing, which can be felt internally; constant

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desire to cough, owing to too much mucus in the chest; continued desire to cough, from a constriction of the trachea, expectorating a greenish mucus; sore feeling in the chest, with a horrid cough, expectorating blood; yellow expectoration having a putrid taste; salty expectoration. Fit of asthma, obliged to breathe hurriedly for a long time.

DOSE.—First six triturations.

AGGRAVATION.—Motion, reading aloud and at night.

AMELIORATION.—During the day; warmth and sitting down.

Stigmata Maidis.—Great excess of lithic acid gravel in the urine; the urine is loaded with lithic acid and deposits a large amount of red sand; chronic cystitis. Much mucus in the urine

This is one of our best remedies for phthisis, as soon as the cough begins to loosen; the accumulation of mucus is great, raised with some difficulty. The party coughs day and night, but worse in the night; hoarseness, the larynx and trachea being much inflamed. All the symptoms of Stigmata greatly resemble those of Lycopodium, and it is hard to distinguish which one of the remedies should be selected. There is more flatulence in the digestive organs where Lycopodium is indicated, and the disease is more chronic. Stigmata cases are more acute in nature, and develop with more rapidity.

DOSE.—From two to ten drops of the Fluid Extract.

AGGRAVATION.—At night.

AMELIORATION.—During the day.

Sulphur.—Constant heat on top of the head, palms of the hands and

In phthisis this remedy is the back bone of our school, and

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soles of the feet, constantly putting the feet out of bed to get them cool. The patient feels constantly hot all over the body. Very weak and faint at 11 A. M., cannot wait for dinner. Early morning diarrhœa, that drives the patient out of bed in great haste,—can't wait, must go to stool as soon as the desire is felt. The stools are extremely acid, the anus is sore and excoriated. Obstinate chronic constipation, stools dark, hard and dry, expelled with great straining; accompanied with piles that bleed much; from abdominal plethora. Excoriating diarrhoea, especially in infants. In women, menses too early, too profuse and last too long, and are very excoriating; acrid, excoriating leucorrhœa. Feels suffocated, wants the windows and doors open, with frequent hot flashes, with faintness, followed by perspiration and much debility. Much rattling of mucus in the lungs; catarrhal symptoms get worse and worse with a loose cough. Plastic pleurisy with serous exudations. Chronic rheumatism. Vesicular

but few cases can be treated without its aid, and about all kinds of coughs yield to its power, but more particularly chronic bronchial catarrh, with excessive collection of mucus, or muco-purulent matter and loose, rattling cough, and easy expectoration, especially in the day-time. At night, the mucus is more tenacious and raised with greater difficulty, but becomes easy again in the morning. Baehr says: "In chronic bronchitis, Sulphur is undoubtedly the most important remedy we have, because it corresponds to the worst and most inveterate cases. If emphysema is present, this remedy may never yield any marked results. Brilliant results may, however, be obtained in cases of chronic catarrh of long standing, if the mucus is secreted in large quantities, or is very tenacious, and the symptoms point to a decided thickening of the mucous membrane. An eminent indication for Sulphur is, the excessive sensitiveness of the skin, so that every trifling change of tem-

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eruptions on the skin, greatly aggravated by warmth. Excessive sensitiveness of the skin; patient is powerfully affected by changes of temperature, which aggravates all symptoms. Patient is happy, has happy dreams and everything looks beautiful. Aggravation in cold, damp weather, from getting warm in bed, and afternoon to midnight. Adapted to subacute and chronic cases.

perature causes an exacerbation, and that even if the patient remains in his room, —he is still powerfully affected by changes in the weather. Only this hyperæsthesia must not be caused by pulmonary tuberculosis; the tubercles at least must not be in a state of suppuration. What we have said shows that the symptoms may be distinguished in two series. The cough is either loose, the mucus easily detached, but only at times, so that at night, for instance, there is a good deal of dry cough, whereas in the morning and during the day the cough is moist. The expectoration is mostly white, compact, but mixed with a number of yellow or green lumps, showing that the mucus had been secreted in the bronchi for a long time before being coughed up; it has a foul taste and even a bad odor, and accompanying hoarseness and sensation of rawness, show that the larynx and trachea have become involved in the pathological process. Or else the cough commences in more violent paroxysms, with considerable dyspnœa, is dry and spasmodic, with wheezing in the chest; it occurs most generally late in the evening and in the night, and it is only towards morning, or after rising, that a tenacious, glossy mucus is brought up after a slight coughing spell. The digestive symptoms, and the condition of the liver, which generally appears very much enlarged in chronic catarrh, confirm the selection of Sulphur. It has always seemed to us that the tritu-

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rations did not act so well in this disease as the attenuations prepared from the alcoholic tincture, and that as a rule, higher potencies acted better than the lower; and finally Sulphur acts better on the young than in the old."

Dr. Hirschel says: "Sulphur allows a far more extensive application in chronic forms; less, perhaps, by its specific relations to cough than by its vasomotor effect, and by its power of causing a reaction in the metamorphosis. It acts favorably where the course of the disease is slow, without coming to any decision in acute cases; as in catarrh or inflammation (Sulphur effectually develops hepatization), as well as in chronic diseases of the respiratory organs, and of the heart. Sulphur shows in the proving all sorts of coughs, and different expectorations; but the constitution of the patient and the adjectiva of the disease give us hints for its selection. Whenever a dyscrasia is on hand, the physician remembers sulphur."

Marcy and Hunt say: "Hahnemann regarded phthisis as a psoric disease, and Sulphur as the first anti-psoric remedy. He refers to six cases in which consumption was caused by the repulsion of psora from the skin; later writers have admitted that Sulphur is a specific for itch, and also for the diseases caused by its recession. Sulphur is specifically suited for phthisis in psoric constitutions of lymphatic temperament, subject to venous plethora and hæmorrhoids. There is predisposition to take cold from slight exposure, running into chronic catarrh; eruptions resembling those of scrofula appear on the skin; rheumatic pains without swelling; drawing pains in the limbs; unsteady gait and tremor of the hands; great general prostration; nervous ex-

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haustion following debilitating losses; numbness of different parts, paralysis and emaciation; pains worse at night, relieved by external warmth; drowsiness and disturbed sleep; disturbing dreams; hallucinations and timidity. The patient curable by Sulphur has generally some eruptive disease of the skin, or has had such affection (not necessarily the itch) repelled from the surface at some former time; he is subject to abscesses, boils or swelling of the glands; hectic fever, followed by night sweats, or profuse sweat from slight heat or exercise. There is hypochondriac sadness, disposition to weep; *irritated, taciturn* disposition; the head is dizzy; intolerance of light. Pale face, wan, blanched, sickly, bloated, with wrinkled countenance; blue margins around the eyes; hepatic spots in the skin; swelling of the gums; dryness of the tongue; favus on the skin. The throat is dry; mucous expectoration; sore throat; vesicles on the surface; pressure in the throat as if from a lump; tonsils red and swollen; uvula enlarged; putrid taste in the morning; ravenous appetite, or loss of appetite; acidity of the stomach and sour eructions; heartburn, morning nausea, waterbrash, acid vomiting. The stomach is painful on pressure; swelling, burning and cramplike contraction or spasm of the stomach; malaise before a meal; nausea after eating. Pain in the abdomen, with sensitiveness of the surface; spasmodic contraction; colic, cutting pain with nausea, followed by diarrhœa and tenesmus; hæmorrhoids, constipation with pain in the rectum as if it would protrude; mucous stools streaked with blood, passed with ascarides or lumbraci; strangury, fœtid urine. The throat feels *rough*, the larynx dry, sore, its sides swollen and feeling as if something lodged there. Hoarseness or loss of voice; catarrh;

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fluent coryza, rawness or spasmodic contraction of the chest; cough dry, short and hacking, and after a meal exciting retching or vomiting. At a later stage the cough is looser, raising thick mucus, then greenish masses; the cough excites violent headache, which in the occiput is pulsative; spitting blood. The breathing is spasmodically arrested; asthma excited by a long rapid walk, or ascending the stairs; suffocative paroxysms, especially coming on at night; talking causes weak feeling in the chest; oppression or contractive pain there; neuralgic stitches of the chest, extending to the sternum or back; palpitation of the heart, anxious throbbing with flush of the face, or rush of blood to the head. Leucorrhœa; irregular menstruation; cold hands and feet."

Asthma, in chronic cases, complicated with eruptive skin diseases; rheumatism, or some constitutional taint; it may be either humid or dry, but generally the breathing and cough is neither loose nor dry, but half way between, of a wheezing character; there seems to be much mucus in the lungs, but none, or only a trifle, is expectorated; sensation as if the lungs touched the back while coughing. Sulphur is adapted to nearly every kind of asthma, but is the most useful in the humid form. Burning of the feet at night; patient has to put them out of bed to cool them; frequent flushes of heat, with suffocative cough. Hæmoptysis that gets almost well, then returns again and again.

The symptoms of Sulphur are so numerous and so contradictory, that I will leave the physician to make out the balance by physiological induction and clinical experience.

Dose.—From the tincture up to the one thousandth; the first thirty being the most useful.

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AGGRAVATION.—Afternoon to midnight; cold, damp weather, or open cold air; and from getting warm in bed.

AMELIORATION.—By heat; dry weather, and motion.

Sulphuric Acid.—Great debility, with sensation of tremor all over the body without trembling. Great exhaustion from some deep-seated dyscrasia. Aphthæ, attended with much pain. Coldness and relaxed feeling in the stomach, with loss of appetite and great debility. Diarrhœa with excessive prostration, hæmorrhages from all the outlets of the body, of dark blood. In women, constant flushes of heat at the climacteric, with a tremulous sensation all over the body; menses too early, too profuse, and always preceded by a distressing nightmare. Patient feels as if everything must be done in a great hurry. General and great debility. Copious and exhausting night-sweats.

In the last stages of phthisis, with aphthous sore mouth and profuse exhausting night sweats, it is the best remedy we have, and the physician is often made happy for its great value in this tormenting and prostrating symptom. It is more especially called for in profuse morning sweat; affecting principally the upper part of the body, and accompanied with excessive and extreme debility. The old school give from twelve to twenty minims at a dose, three or four times a day, of the dilute Sulphuric acid. The second and third decimal dilutions of the chemically pure drug in our hands will yield fine results. In Aphthæ, when the mouth is filled with ulcers, which are exceedingly painful to the patient in the last stages of consumption; the saliva is secreted in great quantities. Sulphuric acid applied with a spray three times a day will greatly comfort the patient and arrest the ulceration. Or it can be mixed with glycerine and applied with a camel's hair

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pencil. Dilute Sulphuric acid may also be used as a gargle.

DOSE.—First three dilutions of the C. P.

AGGRAVATION.—Open cold air, and evenings.

AMELIORATION.—Open warm air, and from vomiting.

Tartar Emetic.—Loose, rattling cough, which sounds as if there was a cupful of mucus in the lungs, and they were about to run over; large collection of mucus in the bronchial tubes, expectorated with great difficulty from paralysis of the vagi. Paralysis of the lungs with great dyspnœa, and fits of suffocation. Very great thirst day and night, with nausea and vomiting. Œdema of the lungs; coliquative diarrhœa. Much yawning. Lumbago.

In phthisis this remedy is indicated when we have a very loose, rattling cough, the lungs seem loaded with mucus, but none is expectorated. Dr. Hirschel says: "Tartar emetic. Cough *rattling;* it sounds loose without being loose; cough with vomiting of food after eating; stertorous tracheal and bronchial rattling; the rattling necessitates sitting up, with vomiting or dyspnœa and fear of suffocation. In the teething cough of children, where we frequently hear the rattling from afar, and disappearing after the paroxysm of cough. In pneumonia with high-graded hepatization, it aids expectoration when resolution begins to take place. In chronic bronchial catarrhs, emphysema bronchiectasia, senile catarrhs. It gives great alleviation in tuberculosis pulmonum, but also more rapid dissolution of the tubercles, and hastens the downward course. In croup, as an intermediate remedy for the solution, and to keep off paralysis. It acts well in those cases without producing emesis."

"Copious accumulation of mucus in the air-pas-

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sages, deficiency of aeration caused by its presence, numerous moist rattles, severe spasmodic suffocative cough. Tart. em. is more adapted to subacute than to chronic affections of the air-tubes; hence its frequent application in bronchial catarrh for children and aged persons. Infants especially sometimes exhibit in the course of chronic bronchitis sudden and alarming symptoms of suffocation, and mechanical irritation of the fauces is not always convenient or tolerated. In such cases a vomiting dose of this salt does much good and cannot do harm. A solution of one grain of the first decimal trituration to half an ounce of water, one teaspoonful every ten minutes, usually suffices in two or three doses to produce emesis; and in this way throws off the accumulated mucus, and then the third trituration will finish the cure."—Meyhoffer.

In capillary bronchitis, Dr. T. Nichol says: "Tartar emetic is unquestionably the great remedy for this dangerous form of bronchitis, and all who have used it can endorse the recommendation of Dr. Hughes: 'perfectly homœopathic to both the local and the general condition. I have almost invariably relied upon it single-handed, and have seen desperate cases recover under its use.' Kreussler says 'that he has found it very efficient in the last hours, when the patient struggles hard.' Baehr remarks that 'it is really the second stage of the catarrhal process that is adapted to the curative action of this drug;' but my experience is that it should be given promptly and without delay as soon as the disease is diagnosed. Aconite is the only remedy that can compare with it in value in this disease. Tartar em. is indicated by severe spasmodic suffocative cough, with wheezing respirations and marked dyspnœa; also by rattling

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cough which ends with vomiting of thick white mucus; also when the cough suddenly ceases from weakness or paralysis. The actions of the patient seem to show that he is suffering from oppression at the chest; and the mucous ronchus, indicating a very copious accumulation of mucus in the bronchial tubes, is one of the leading features of the case. This accumulation forms a mechanical obstruction to respiration, and accordingly we have a group of symptoms of Carbonic acid poisoning more or less pronounced; great anxiety and agitation, pale and bloated face, coma or delirium, with coldness of the extremities. Profuse, cool sweat, not followed by relief, and a disposition to vomiting and diarrhœa would be additional indications. Acts best in 3d and 4th 'triturations.' In humid asthma this is often valuable in acute cases complicated with catarrh of the lungs, especially in children, with much congestion and inflammation of the bronchial mucous membrane, and the tubes filled with mucus; much choking and rattling, but the mucus cannot be raised without great exertions."

DOSE.—First three triturations.

AGGRAVATION.—Evening: cold damp weather, and warmth.

AMELIORATION.—Open cool air, and during the day.

Tar and Tar Water.—This is an old fashioned but a very valuable remedy in phthisis where the bronchial mucous membrane is largely involved. Tar has a specific action on all mucous membranes, especially that of the lungs. The cough is very loose, often paroxsymal and very violent, affecting the patient day and night. The expectoration is rather abund-

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ant, frothy, yellow or muco-purulent, and often very fœtid; breathing rapid; much rattling of muco-purulent substance in the lungs; loss of appetite; night sweats and much debility. In these cases the action of tar and tar water is very marked, greatly stimulating the mucous membranes and producing healthy nutrition. In a week, a great improvement usually takes place, often arresting the disease in a month. The tar should be given in from two to five grains (in pills or capsules) once in three hours. For a drink, cover the bottom of a quart dish one quarter of an inch thick, and then fill the dish with warm or cold water; drink this in broken doses, so that it all will be taken in one day. Prepare fresh every night and it will be ready for use in the morning. The tar can be renewed once a week.

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[SEE CUT NEXT PAGE.]

It is formed like the hour-glass, with rubber ear tubes, and rubber tympanum in the top, which greatly magnify the sound waves. This gives us a more accurate differential diagnosis, as different breath-tones are produced in different diseases, when the patient breathes into the instrument. When applied to the chest, its superiority over the Stethoscope will at once be established, and the diagnosis of all thoracic diseases will be greatly simplified by the use of this instrument. The cut shows it one-half size.

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INDEX.

	PAGE.
Administration of Liquids	120
Aconite	144
Ætiology	9
Albuminoids	44
Argentum Nit.	148
Arsenicum	145
Aphthæ	141
Apple	114
Apricot	115
Aqueous Vapor	70
Banana	118
Barley	100
Baptisia	152
Belladonna	150
Beer	100
Bed Sores	143
Beef Tea	106, 109
Beef Juice	109
Bovinine	110
Bryonia	152
Buttermilk	95
Carbonic Acid Water	35
Carbonic Acid in Phthisis	36
Calcaria Carb. et Phos.	154
Carbo-hydrates	42
China	157
Cherry	115
Cream	96
Chicken Broth	109
Clam Juice	99
Cocaine	158
Conium	159
Condensed Milk	96
Cough	137
Cough, Moist	138
Cough, Asthmatic	139
Cough, Hoarse	139
Currant	117
Cuprum Phos.	160
Climate	31
Cod Liver Oil	52
Date	116
Diet	40
Digitalis	160
Diarrhœa	141
Distilled Water	97
Eggs	104
Fæces	86
Fluid Food	88
Ferrum	161
Fruits	102, 121
Fruit Jellies	98
Fruit Juices	98
Figs	119
Fluid Beef Extracts	106
Gaseous Food	68
Gaseous Enemata	134
Grape Juice	96

Hosted by Google

Grape Cure 97
Goosberry 117
General Atony . . . 136
Gruels 100

Hamamelis 165
Hæmoptisis 136
Hectic Fever . . . 139
Hepar Sulphur . . 165
Hydro-carbons . . . 46
Hydro-therapeutics . 29

Iodine 168
Ipecacuanha 173
Introduction . . . 5

Kali Bich 175
Kali Carb 176
Kali Chlor 179
Kali Hyd 177
Keefer 98
Kidneys 76
Koumiss 97
Kreosote 180

Lachesis 181
Lemon 117
Lemonade 99
Lime 117
Lungs 80
Lycopodium . . . 183

Malt Extracts . . . 102
Malted Milk 94
Melon. 118
Mercurius Sol. . . . 186
Mercurius Protoiod. . 189
Millefolium 191
Milk 93
Mineral Water . . . 92
Muriatic Acid . . . 191

Night Sweats . . . 140
Nitric Acid 192
Nitrogen 69
Nux Vomica 194

Opium 195
Olive 115
Orange 116
Organic Matter . . 72
Oxygen Gas 33
Oxygenated Water . 34
Oysters 106

Pear 114
Peach 115
Peptonized Milk . . . 94
Plum 115
Pneumatoscope . . . 227
Phosphorus . . . 197
Phosphoric Acid . . . 204
Phosphate of Copper . 160
Pineapple 119
Pomelo 117
Prevention of Intermarriages 92
Prophylaxis . . . 20
Pulsatilla 205
Purification of Water . 92
Pulque 99

Quince 115

Raw Meat Pulp . . . 109
Rain Water 91
Rectal Administration . 130
Respiration 82
Rice Water . . . 100
River Water . . . 91
Rhus Tox 207
Rumex Cris 209

Salts, Mineral . . . 64

Hosted by Google

Sanguinaria . . . 211
Silicia 213
Skin 78
Skimmed Milk . . . 95
Shaddock 117
Solid Food . . . 120
Spring Water . . . 91
Stannum 216
Stigmata Maidis . . 217
Strawberry . . . 118
Soup 110
Sulphur 217
Sulphuric Acid . . . 223
Spongia 216
Sputa 85
Tar and Tar Water . 226
Tartar Emetic . . . 224
Thoracic Pain . . . 143
Toast Water 100
Transmission of Phthisis 15
Tubercular Bacillus . . 14
Tubercle Chemistry . 85

Valentine's Meat Juice . 116

Water . . 73, 90, 127
Whey 95
Wine Whey . . . 96

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